DOCUMENT RESUME

ED 140 241 CS 003 445

AUTHOR	Rawson, Margaret Byrd, Ed.
TITLE	An Interdisciplinary Journal of Specific Language Disability. Volume 25.
INSTITUTION	Orton Society, Towson, Md.
PUB DATE	75
NOTE	225p.; Proceedings from the World Congress on Dyslexia (Rochester, Minnesota, November 1974) ; Parts may be marginally legible due to small print of the original document
AVAILABLE FROM	Orton Society, 8415 Bellona Lane, Towson, Maryland 21204 ($5.00)
JOURNAL CIT	Bulletin of the Orton Society; v25 1975
EDRS PRICE	MF-$0.83 HC-$11.37 Plus Postage.
DESCRIPTORS	Diagnostic Teaching; *Dyslexia; Elementary Secondary Education; Followup Studies; *Learning Disabilities; Neurologically Handicapped; Predictor Variables; *Reading Difficulty; *Reading Research; Remedial Programs; *Remedial Reading; Speech Handicapped
IDENTIFIERS	*Orton (Samuel)

ABSTRACT

This silver anniversary issue contains papers from the World Congress on Dyslexia held in November 1974, as well as two case studies and reviews of books related to the study, treatment, or prevention of problems of specific language disability. Papers include discussions of 50 years of experience with dyslexia; prediction and prevention of reading disability; tutorial and group instruction in a hospital language-research unit; cluttering and stuttering; the marginally ready child; early speech and language problems; predictive antecedents of specific reading disability; dichotic listening with related tasks for dyslexics; a follow-up study of 216 dyslexic children; case studies of two dyslexic girls; and discussions of the life and work of Samuel T. Orton. (AA)

****
* Documents acquired by ERIC include many informal unpublished *
* materials not available from other sources. ERIC makes every effort *
* to obtain the best copy available. Nevertheless, items of marginal *
* reproducibility are often encountered and this affects the quality *
* of the microfiche and hardcopy reproductions ERIC makes available *
* via the ERIC Document Reproduction Service (EDRS). EDRS is not *
* responsible for the quality of the original document. Reproductions *
* supplied by EDRS are the best that can be made from the original. *
****

U S DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

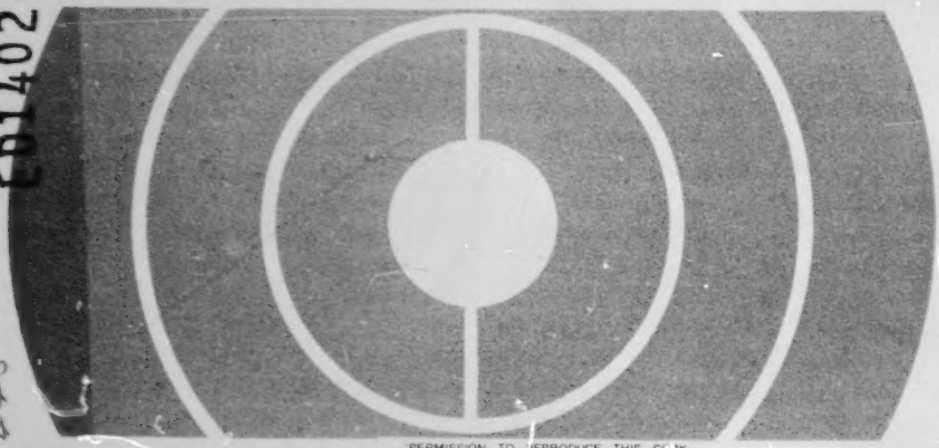
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

BULLETIN OF THE ORTON SOCIETY

AN INTERDISCIPLINARY JOURNAL OF SPECIFIC LANGUAGE DISABILITY

ED140241

CS 200 B445



PERMISSION TO REPRODUCE THIS COPYRIGHTED MATERIAL HAS BEEN GRANTED BY

Orton Society, Inc.

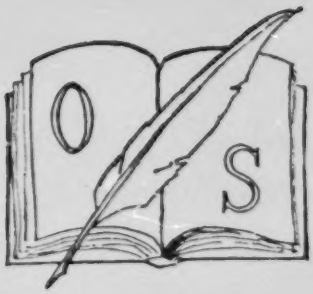
TO ERIC AND ORGANIZATIONS OPERATING UNDER AGREEMENTS WITH THE NATIONAL INSTITUTE OF EDUCATION. FURTHER REPRODUCTION OUTSIDE THE ERIC SYSTEM REQUIRES PERMISSION OF THE COPYRIGHT OWNER

XXV 2 1975

BULLETIN OF THE ORTON SOCIETY

Volume XXV, 1975

Editor: Margaret B. Rawson *Associate Editor*: Jan paul Miller



THE BULLETIN OF THE ORTON SOCIETY is published annually by the Orton Society, Inc., and sent to all members without charge. Additional copies of this issue may be secured by members for $4.00 each; by non-members for $5.00. Orders should be sent prepaid to the Orton Society, 8415 Bellona Lane, Towson, Md., 21204. Copyright © 1975 by the Orton Society, Inc. Manufactured in the United States of America. All rights reserved.

FOREWORD

This silver anniversary issue of the *Bulletin* contains papers from the World Congress on Dyslexia sponsored by the Society with the cooperation of Mayo Clinic in Rochester, Minnesota, in November 1974. The two case studies and the reviews are, of course, not part of the Congress proceedings.

As always, the views represented throughout this volume are those of the writers, for the Orton Society holds neither an official view nor judgmental responsibility. Responsibility for inclusion of all materials in the *Bulletin* rests with the Editors, to whom they seemed relevant to the Society's stated purpose: "the study, treatment, and prevention of problems of specific language disability."

An index to the first twenty-three volumes is available, as well as a brochure stating the Society's purpose, conditions for membership, and a current listing of publications. Interested persons should write the Society's central office for such information.

Comments and criticism from readers are welcome. Papers and other contributions to be considered for publication in Volume XXVI should be submitted as long as possible before January 1, 1976 in conformance with the Instructions to Contributors on the last page of the *Bulletin*.

Margaret Byrd Rawson
Editor

The Orton Society
8415 Bellona Lane
Towson, Maryland 21204

Contents

Foreword iii

The Samuel T. Orton Award for 1974 1

A Fifty-Year Review of Experiences with Dyslexia 5
Lauretta Bender, M. D.

Fascinating Journey: Paths to the Prediction and Prevention of Reading Disability
Archie A. Silver and Rosa A. Hagin 24

Tutorial and Group Instruction in a Hospital Language Research Unit
Aylett Royall Cox 37

Cluttering and Stuttering
Katrina de Hirsch, F.C.S.T. 57

The Marginally Ready Child
Jeannette Jefferson Jansky, Ph.D. 69

Early Speech and Language Problems
Sister M. Winifred Danwitz, Ph.D. 86

Some Predictive Antecedents of Specific Reading Disability: A Three-Year Follow-up
Paul Satz, Janette Friel, and Ron A. Goebel 91

Dichotic Listening with Related Tasks for Dyslexics—Differential Use of Strategies
C. K. Leong 111

Follow-Up Study of 216 Dyslexic Children
Carl L. Kline, M. D., C.R.C.P.(C) and Carolyn Lacey Kline 127

Samuel T. Orton, M.D. Who Was He?
Part I. Biographical Sketch and Personal Memories
June L. Orton; Lloyd J. Thompson, M.D.; Paul C. Bucy, M.D.; Lauretta Bender, M.D.; Mary Helen Robinson, and Paula Dozier Rome 145

Part II. Samuel T. Orton—Yesterday and Today
In Neurology
Richard L. Masland, M.D. 156
Part III. Samuel T. Orton—Yesterday and Today
In Education
Margaret Byrd Rawson 160
Dyslexia International 163
Two Dyslexic Girls Grow Up
The Unheard Cry—Help Me! A Plea to Teachers
of Dyslexic Children
Phyllis Steingard and "Gail" 178
I Am Me!
"Louise Baker" (with Margaret B. Rawson) 185
Reviews 200
Instructions to Contributors 216

THE ORTON SOCIETY, INC.

OFFICERS 1975

President ..... N. Dale Bryant, Ph.D.
First Vice-President ..... Lucia R. Karnes, Ph.D.
Second Vice-President ..... Jane McClelland
Third Vice-President ..... Paula D. Rome
Recording Secretary ..... Dorothy M. Tower
Corresponding Secretary ..... Eleanor T. Hall
Treasurer ..... Robert B. Chapman, III
Past President ..... Roger E. Saunders

BOARD OF DIRECTORS
(All of the above and the following)

Term expires 1975
C. Wilson Anderson, Jr.
Aylett R. Cox
George Meyer, Chairman, Branch Council
Gilbert B. Schiffman
Betty Wells
Paul M. Williams

Term expires 1976
Alice Ansara
Robert B. Chapman, III
Mary Lee Enfield
Georgie F. Green
Marian L. Kirkbride

Term expires 1977
Sally B. Childs
Drake D. Duane
Tucky P. Heller
Jeannette J. Jansky
Margaret Byrd Rawson

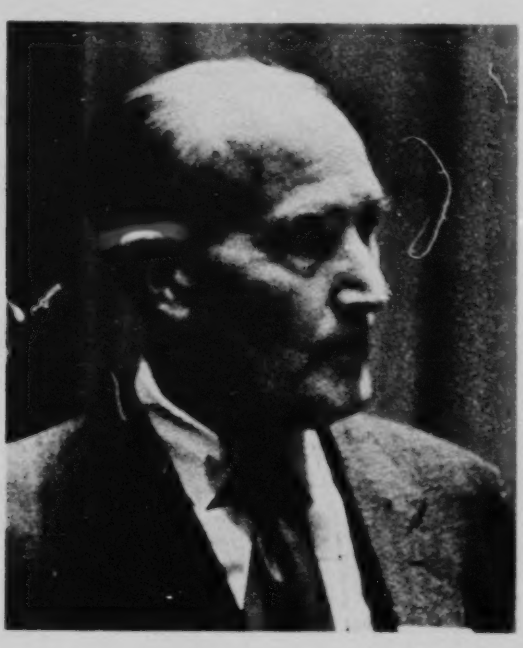
Advisory Council

Lloyd J. Thompson, M.D., Chairman
Lauretta Bender, M.D.
Arthur L. Benton, Ph.D.
John B. Bigelow, M.A.
Milton Brutten, Ph.D.
Edwin M. Cole, M.D.
Macdonald Critchley, M.D.
Leon Eisenberg, M.D.
J. Roswell Gallagher, M.D.
Manuel R. Gomez, M.D.
Rosa A. Hagin, Ph.D.
Katrina de Hirsch, F.C.S.T.
Carl L. Kline, M.D.
Paul V. Lemkau, M.D.
Richard L. Masland, M.D.
John McLeod, Ph.D.
Zdeněk Matějček, Ph.Dr.
June Lyday Orton, M.S.S.
Ralph D. Rabinovitch, M.D.
Howard P. Rome, M.D.
Archie A. Silver, M.D.
Beth H. Slingerland, B.A.
Lucius Waites, M.D.
Leon J. Whitsell, M.D.

STAFF

Executive Secretary ..... Linda M. Frank

The Orton Society, Inc.
8415 Bellona Lane
Towson, Maryland 21204



The Samuel T. Orton Award for 1974

Presented by the Orton Society to

Macdonald Critchley, M.D.

Past President, World Federation of Neurology

PRESENTATION BY HOWARD P. ROME, M. D.

President, World Psychiatric Association

The 1974 recipient of the Samuel T. Orton Award, as our Scottish colleagues say of a person possessed of his many talents, is, indeed, a man of parts.

Because Madonald Critchley wears his many honors modestly, I will not gild the lily of his impressive curriculum vitae except to note that in acknowledgment of his services to the Empire at home and abroad in 1962 the Crown made him a Commander of the British Empire.

His recognition has spread throughout the international community of neurology inasmuch as his contributions to that medical discipline are attested by his honorary membership in 22 national neurological societies. This tribute to a consumate clinician was climaxed by his election to the Presidency of the World Federation of Neurology, an office he has served with distinction for the past eight years.

It is consonant with the mores of professional academia that when it seeks to memorialize a distinguished scholar, it establishes a lectureship in his name—much as we pay homage to Dr. Orton. It is customary that a person equally renowned for his scholarship be invited to present the named lecture. Dr. Macdonald Critchley has been thus rewarded on twenty-one occasions. The lectureships bear the enduring names of Wm. Harvey, John Hunter, Wm. Croone, Hughlings Jackson and Charles Sherrington among others.

I think it can be said of Dr. Critchley that whereas most professors in academia are said to hold a chair, in a characteristic peripetetic fashion Critchley has occupied a remarkably portable settee—having at various times had the distinction of having been a visiting professor at Universities as far removed as Turkey and Australia as well as institutions en route to the antipodes.

In an eloquent tribute to his teacher, the gifted Sir Francis Walshe, Critchley's penchant for *le mot juste* led him to quote William James' observation which epitomizes the searching qualities of the man whom we honor tonight: "Round about the accredited and orderly facts of every science," (James wrote) "there ever floats a sort of dust-cloud of exceptional observation."

Dr. Critchley's inquiries range from a query as to why Aurignacian man's cave paintings show only hand prints of the left hand, to observations on such mundane hand skills as are required to unscrew a champagne cork or are used to grip a cricketer's bat. His writings are both gems of lucidity and troves of allusions. They display a familiarity with an incredible sweep of persons and events that comprise a gamut from what Herbert Spencer in 1857 said about song to the remarks of the late French chantuse Edith Piaf that "a song isn't a tune on one side and the words on the other; they are a unity."

Language in all its breadth and dimensions has been Macdonald Critchley's consuming preoccupation. His textbook: "Aphasiology and Other Aspects of Language" is a compendium as well as a penetrating critique of everything important to this unique sphere of communication. Being attentive to the cue, all but hidden in nuance, Critchley's facile use of examples

draws from an almost inexhaustible repertoire of anecdotal material, illustrative of a profound knowledge of the structure and meaning of language.

I cannot resist calling to the attention of this audience, intrigued by language as you are, a recent cameo piece titled: "Aphasia in Polyglots and Bilinguals." Critchley refers to Kempe who in 1569 contended that God spoke to Adam in Swedish; Adam replied in Danish; while the serpent addressed Eve in French! Not content with the authenticity of this linguistic nugget, Critchley adds that Chardin insisted that there were three languages spoken in the Garden of Eden—Arabic by the serpent, Persian by Adam and Eve, and Turkish by the angel Gabriel.

And so by circumlocution, I come to dyslexia. Critchley has said his interest was aroused in 1925 when at the National Hospital, Queen Square, London, there came under his care a girl whose difficulty was consistent mirror-writing. Typically his investigation led to a monograph, *Mirror Writing*, published in 1927. Dr. Critchley's account of the reception given his Doyne Memorial Lecture given at Oxford in 1961, is reminiscent of the scepticism I am sure is encountered by educators who have the temerity to suggest that dyslexia is the paramount reason why Johnny can't read.

The Orton Society honors itself in bestowing on Dr. Macdonald Critchley the Samuel T. Orton Award. Sir: your writings, lectures and organizational efforts have done much to acquaint the world with the nature and remedy of this all-too-human problem. For this we are in your debt.

Citation

The Orton Society, Inc. takes pleasure in presenting its 1974 Samuel T. Orton Award to Macdonald Critchley, C.B.E., M.D., F.R.C.P., F.A.D. (Hon.).

Scholar *par excellence*, distinguished author and medical historian, and compleat neurologist, his extensive knowledge of the vagaries of human communication has earned his international renown. His contributions to an understanding of the neurolinguistic complexities of dyslexia have shed much needed light on a disability which for too long has confounded educators and physicians alike. For his many salient observations, this award is presented to Dr. Critchley at the 25th Annual Meeting of the Orton Society, November 8, 1974, Rochester, Minnesota.

Response by Dr. Critchley

This is a distinction which has befallen me. It touches me and I receive it with considerable pride and pleasure.

During the long years which have been veritably a crusade in my country for the recognition of dyslexia as an entity among physicians, psychologists, and teachers, I have had many ups and many downs, but always behind me there was the moral and intellectual support, first of Dr. Orton and then of the Orton Society. I am deeply appreciative and very proud to be associated with the Society.

I shall speak very briefly because there are several people whom I am eager to hear as they tell us things they have known at first hand about that great man, Dr. Orton. Then again, as you know too well, we British are very inarticulate, at least by reputation. It is with great difficulty that people push us to our feet, and then usually we content ourselves with either a grunt, a gesture, or an exclamation. So I shall conclude, if I may, by three such gestures:

First, Thank you, indeed, a thousand times for your kindness and for the distinction you have conferred on me.

Secondly, My heartiest congratulations on the success of this Congress, which has been, as you would say, out of this world.

And thirdly, Hope, my sincere and fervent hope, for the future.

Thank you.

NOTE: Dr. Critchley opened the 1974 World Congress on Dyslexia with an address entitled, "Development Dyslexia: Its History, Nature and Prospects," which appears in a book entitled *Reading, Perception, and Language*, edited by Drake D. Duane and Margaret B. Rawson, and published by York Press (cloth edition) and by the Orton Society (paperback edition). See announcement, page 215, below.

A Fifty-Year Review of Experiences with Dyslexia

Lauretta Bender, M.D.

Attending Psychiatrist, Department of Mental Hygiene,
Psychiatric Institute, New York;
Clinical Professor of Psychiatry (retired),
Columbia University College of Physicians and Surgeons, New York
(Present address)
423 Ben Oaks Drive West Severna Park, Maryland, 21146

Fifty years ago, in 1923, I transferred from the University of Chicago where I had been studying medicine and pathology to the State University of Iowa, attracted by Samuel T. Orton's reputation as a scholar and researcher of the brain.

At the State University of Iowa I lived at the Psychopathic Hospital which was Dr. Orton's headquarters. There I was officially a neuropathologist, did the routine studies of autopsied brains, taught neuropathology to the medical students, carried out research in neuropathology with Dr. Orton, and continued my medical studies.

I was in almost daily contact with Dr. Orton, who was a genial giant, tall, physically imposing, inexhaustably curious, and with a stimulating, brilliant mentality. He was a keen observer, always alert to new ideas, easily communicative, and always warmly accepting of his students and associates.

Within the year, that is, in 1924, fifty years ago, he was talking about his preoccupations with the problem some children had in learning to read. He was excited about the implication for brain functioning; the possible relationship to dominance in the cerebral cortex and for hands, feet, and eyes; the frequency of reversals in reading and writing or in visual perceptions; the familial trends and evident importance of heredity; and the apparent specificity for all language functions—reading, writing, spelling and speech.

He never doubted that this was a brain problem, but rejected any concept of brain pathology such as he had observed in acquired aphasias and of Hinshelwood's rigid concept of "congenital"; and he entertained a more functional idea of "developmental" (Orton 1925, 1937).

This paper was presented at the World Congress on Dyslexia, Rochester, Minnesota, Novermber 1974.

He searched for a term to describe the child's problem which he then saw as a visual perceptual difficulty with reversal tendencies. He came up with the term "strephosymbolia" which, he explained, had been used by the Greeks to describe the sinusoidal pattern made by oxen in plowing a field, alternating dextrad and sinistrad like a continuing letter "S." It is assumed, of course, that oxen do not have unilateral cortical dominance, and that they accept either direction. In any case, both for the oxen and the man who drives them, the pattern is more a motor than a visual one. The letter "S," interestingly enough, starts on the right and both starts and stops in the sinistrad direction.

This was also the way that I constructed an oxen path for Dr. Orton. For this reason and others, he soon diagnosed me as strephosymbolic and dyslexic. He noted my confused hand-eye dominance, written reversals, right-left spatial disorientation, numerous linguistic difficulties, and gauche motility and mentality, but also the self-confidence of one who had partially corrected herself.

Dr. Orton organized a project for studying the problem in children who were not succeeding in their school work. A Mobile Mental Hygiene Unit was made possible by a grant from the Rockefeller Foundation. It went into the semi-rural areas of Iowa looking for such children. I was a member of the first team as a sort of pediatric neurologist, a specialty not recognized then. I had not as yet devised my Visual Motor Gestalt Test (Bender 1938).

The rest of the story is well known (June L. Orton 1957). Some of the children were studied at the Psychopathic Hospital in Iowa City, and Dr. Orton developed (1928) the definition of "a failure of elision of the memory of images from the non-dominant side of the third level or symbolic level of the visual sensory cortex and therefore a confusion between the visually presented stimulus and its remembered concept."

He always emphasized the function of the brain, how it deviated in the individual child, how it affected the child's learning and, secondarily, the child's personality and behavior; and what could and should be done to help the child.

Since he saw the condition as a developmental retardation or deviation and not a structural defect, he assumed that there was hope for improved functioning "if," as he said later, "we become sufficiently keen in our diagnosis and clever enough to devise the proper training methods to meet the needs of each particular case" (Orton 1937, p. 200).

When I had finished my medical studies in the State University of Iowa,

Dr. Orton secured for me a Rockefeller Fellowship to Holland hoping I could study developmental brain problems especially in relation to speech. The nearest I could come were studies in the cerebellar control of vocal cords in dogs (Bender 1928). I then expected to return to Iowa and continue brain research with Dr. Orton, but meanwhile he had transferred to New York and the Neurological Institute of Columbia University. After completing my training in neurology and psychiatry, I had an informal relationship with Dr. Orton at the Neurological Institute. Eventually thirteen publications on neuropathology and related subjects resulted from my association with Dr. Orton (Bender 1935).

Influence of Other Scholars on My Work

Judson C. Herrick with whom I studied at the University of Chicago investigated and taught the anatomy of the central nervous system from the point of view of evolution, embryology, and development. To him I owe the concepts of the living brain as a stage in transit in evolution and of the mind as a function of the brain. He also said, "Motility is the cradle of the mind. Mentation arises within behavior and primarily for the advancement of its efficiency" (Herrick 1956, p. 240).

He saw development as an extension of evolution, self-regulating and goal directed. He taught that every human action and every human experience is a biological event. He said, "Many puzzling features in the part played by the cortex in regulation of behavior are explained by evolutionary history" (p. 418). He taught that the individual's life pattern is determined by endogenous inborn characteristics modified by his environment and experiences.

In 1925 Dr. Orton referred me to the Phipps Clinic of Johns Hopkins Hospital to work with Adolf Meyer because, he said, I had been trained as an "organicist" and might get new insights from Adolf Meyer's concepts. Adolf Meyer taught that life experiences were the important factor in determining an individual's capacity to work out a solution, whether psychotic or normal, or what he called the "ergasias" (Meyer 1922). I was very much impressed with his concept of the "organism-as-a-whole" which was new in American thinking at that time.

I met Paul Schilder at Johns Hopkins, started to work with him, followed him next year, in 1930, to the New York University and Bellevue Hospital. Subsequently we married and worked together until his death in 1940.

Paul Schilder had a view of life's constructive processes in integrating

body functions, neurological processes, mind, psychology, and social relationships, in a reality-relatedness and a goal-directed fashion. Much of our work at Bellevue together was done with children, of which he said, "The approach to the problems of childhood is a definite dynamic and constructive one. The child is seen as a growing organism with definite problems of maturation. . . . Great stress, however, should be placed on the living situation and emotional problems of childhood life as these are continually modifying the developmental process" (Curran and Schilder 1940, p. 125).

Paul Schilder had several important concepts:

1. The body image (Schilder 1935) is a total integrated gestalt of all the individual's perceptual and social experiences. It is never static. It is in a continuous state of construction. It matures as the child matures and is affected by any disturbance in maturation. It regresses with any disorganizing process. The drawing of a person was found by us in those years at Bellevue to be a projection of the body image (Bender 1940).

2. Motility patterns were first studied by Schilder with Hoff (1927) in organically damaged adults, later in schizophrenic adults, and finally as a maturational pattern in children and related to the tonic neck reflexes and the postural, righting, and whirling responses (Schilder 1931, p. 92, and 1964).

3. "Soft neurological signs" were first noticed by Schilder in the manneristic features of adult schizophrenics, not quite neurological in significance. Later he saw them in children as maturational lags especially in patterned behavior sometimes called "reflex" such as the postural patterns, tonic neck reflexes, ocular motor patterns, vestibular tonic patterns, cortical dominance, and right-left orientation in space. (Schilder 1964).

4. He early emphasized the importance of the vestibular apparatus in relation to tone, motility, equilibrium, and the relationship to the perception of reality (through gravity of the earth) and to interpersonal relationships (Schilder 1942).

5. He explored the tonic neck righting attitudes and whirling motility in development and in the maturational lags of children (Schilder 1964).

The Visual Motor Gestalt Test and What It Demonstrated

While at Johns Hopkins Hospital, 1929-1930, I started work on the Visual Motor Gestalt Test (Bender 1938). In the beginning I used mute, regressed autistic schizophrenic women at the Springfield State Hospital in

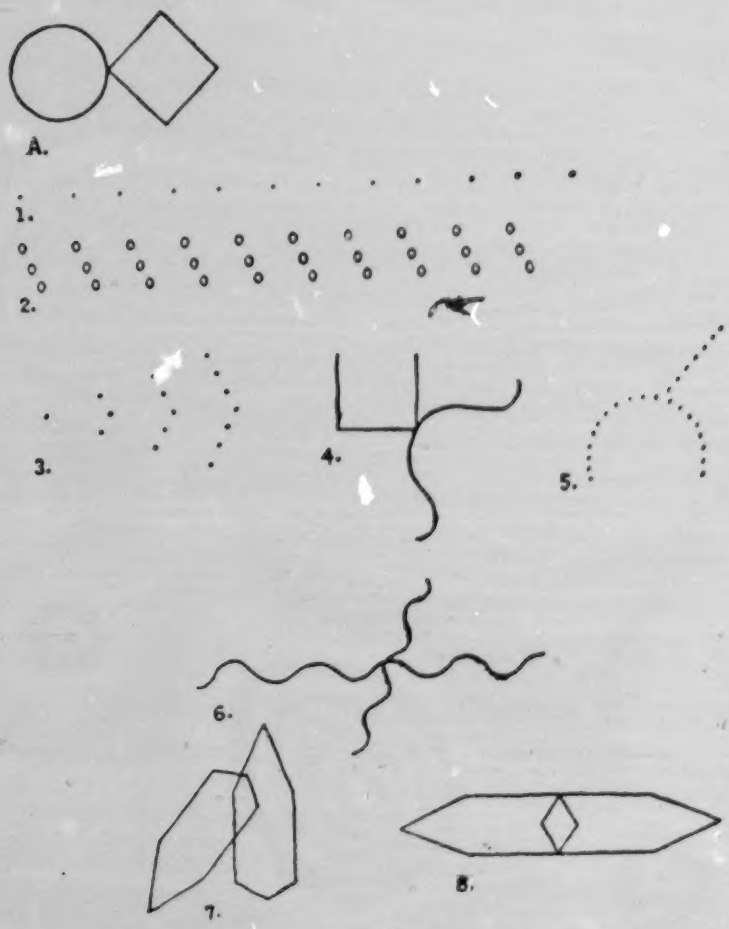


Figure 1. Visual Motor Gestalt Test figures.

Maryland whom I was studying at that time. There I asked the patients to copy the figures which I had adapted from Max Wertheimer's studies in Gestalt Psychology (Wertheimer 1923). (See Figure 1.) This method revealed to me that it was possible to demonstrate many principles in the genesis, evolution, and development or regression of perceptual motor experiences other than the "gute Gestalten" which Wertheimer described. Thus I con-

cluded that there was evidence of "development in the visual motor patterns and that the more primitive sensory motor patterns are dependent on the principle of constant motion which seems to be largely whirling movement in a vortex in a clockwise or counterclockwise direction with an associated radiating directional component and a tendency to emphasize the horizontal plane" (Bender 1938, p. 24).

The next year in New York I began to make observations on both normal nursery school and public school children and on retarded and disturbed children in clinics, institutions and hospitals like Bellevue, as well as on psychotic and brain-damaged adults. Tachistoscopic studies of optic imagery were made on normal adults. These revealed the movement and tendency to regression in imagery and the significance of the time element in the development of visual motor gestalten. Reduced time of perception with the tachistoscope resulted in more primitive and mobile perceptual experiences. Thus it appeared that each individual in every perceptual experience recapitulates the whole maturational process that as a child he had passed through in development. Both spatial and temporal factors in visual perception and how they are integrated in maturation were thus established.

The Visual Motor Gestalt Test is finally evaluated as one of maturation in visual motor gestalt function and of deviations in maturation especially due to biological developmental and organic factors in children and to organic pathology and regression in adults. Maturation and not learning determines the visual motor gestalt function.

I later (Bender 1970) summarized the principles of maturation of visual motor gestalten in children as follows (see Figure 1.): (1) vortical movement, biologically determined, in the optic field gives rise to the most primitively perceived forms such as circles, spheres, and loops; (2) movement, always present, is vortical, directional, clockwise or counter-clockwise; (3) the horizontal plane is first emphasized as directional, dextrad or sinistrad; (4) by controlling or inhibiting these action patterns, globes, circles, and arcs are constructed; (5) this organizes the visual field into foreground and background; (6) boundaries between forms are delineated; (7) verticalization arises concurrently with body image maturation as the postural model shifts in the young child from the prone to the upright posture (Fabian 1945); (8) crossed lines, diagonal or slanting relations or angle formation are a later phase of maturation, usually occurring between six and eight years or at the age for reading readiness.

Figure 2 illustrates the test performance of a normal public school boy of six years two months and six years four months.

At six years two months he had never seen the test before, did not know how many cards there were and did not know how to organize it. Design A he at first placed at random near the center of the sheet of paper and rotated it to the vertical position (Figure 2, left side). On finding that there were more test figures, he erased Design A and redrew it in the upper left hand corner still rotated to the vertical position. He then organized the first six designs in a horizontal row at the top of the sheet of paper. All designs were small and tight. Furthermore designs 1, 3, 4 and 5 were all verticalized or rotated in a clockwise direction to a vertical position. Design 4 had been erased and repeated to allow a better spatial arrangement, and Design 5 was partially closed. Design 6 also had to be erased to allow a better spatial placement, and it was drawn in a vertical position against the left edge of the paper followed by horizontal arrangements of designs 7 and 8. Thus, this boy at six years two months demonstrated many primitive features in his first experience with the test, but he also showed evidence of active organization of the experience. Two months later at six years four months his production and arrangement was rapid, mature, and appropriate for his age (Figure 2, right side). He started in the upper left hand corner and the following five designs were arranged vertically on the left side of the sheet with Designs 6, 7, and 8 in another vertical series to the right of the first series. There was no verticalization or rotation of designs, though figures 2 and 3 tended to slant upwards. Designs were somewhat global and variable in size. Essentially the test on this occasion was normal for the boy's age. At nine years nine months he was reading better than the average of his peers in a good suburban school.

Figures 3 and 4 illustrate the test performance of a boy, Mathew, with dyslexia. His Visual Motor Gestalt Test performances were done when he was ten years six months (Figure 3) and ten years eight months (Figure 4). He was one of a set of fraternal twin boys who were sent to the Children's Unit of Creedmoor State Hospital because he and his twin brother were school problems and unmanageable at home. The school had already recognized that both boys had reading disabilities and had placed them separately in special remedial classes where they were beginning to respond. It was the mother who felt that she could not tolerate the boys at home because they were infantile in behavior, aggressive, and provocative.

Mathew's Wechsler Intelligence Scale for Children (WISC) gave him a full

Figure 2. Visual Motor Gestalt Test performance of a normal public school boy, aged 6 years 2 months and 6 years 4 months.

Figure 3. Visual Motor Gestalt Gest performance of Matthew, aged 10 years 6 months.

Figure 4. Visual Motor Gestalt Test performance of Matthew, aged 10 years 8 months.

scale score of 85. There was marked variability of functioning with subtest scores ranging from retarded to superior. On the Wide Range Achievement Test (WRAT) his reading score was 1.5 and spelling, 1.6. The psychologist noted that Mathew's written work showed numerous reversals both of the order of letters within a word ("s-a-w" for "was") and of individual letters (ɔ for C). When reading he was impatient and impulsive and failed to scan words carefully. He guessed on the basis of part cues ("kitten" for "little") and did not try to use phonetics.

His Visual Motor Gestalt Test performance was strikingly different from that of the younger normal boy (Figure 2). There was marked variability between the first and second test (Figures 3 and 4) though not showing maturation as in the normal boy. In both of Mathew's tests the individual figures tended to be global and primitive. There was a different organization of the two tests and both showed rotation of figures and unusual direction of performances, sometimes dextrad and sometimes sinistrad. There was an excessive tendency to movement and a failure to master a clear dextrad direction. Movement was both clockwise and counterclockwise. In both tests the figures are arranged at random all over the sheet of paper and more or less equidistant from each other. Thus, the foreground-background differentiation is inadequate.

Research in Reading Disabilities at Bellevue

In 1950 at the first scientific meeting of the Orton Society, I reported on the research studies and observations made on dyslexic children on the Bellevue children's service since 1934, when I became in charge (Bender 1951). I emphasized that there was an organic flavor to learning disorders in children, not due to a brain defect or structural damage but rather due to a developmental lag or immaturity w[illegible]h in many respects was partially correctible in the course of time and [illegible]h the help of training. Paul Schilder in 1935 (published in 1944) made a study on seven children with dyslexia who were seen in the Mental Hygiene Clinic of Bellevue because of behavior problems. His work was not well understood in the beginning because he framed his conclusions in the language of Viennese studies of aphasia referring to "a problem in gnostic intellectual function." However, he started with Orton's (1928) concept of a confusion because of reversals in memory images

which resulted in a failure in association between the visually presented stimulus and its concept associated with visual reversals and difficulties in phonetic spelling. He also used much of the test material of Orton and of Monroe (1932). Schilder emphasized that there was a developmental or familially determined difficulty or insufficiency in optic perception and imagination, and, consequently, a difficulty in coordinating the sound of the spoken word with the pattern of the written word. He also spoke of an incomplete development of auditory perception.

This is now referred to as cross modality (Bryant 1974) or intermodality. Schilder was not the first one to recognize this problem. As early as 1917 Bronner wrote that some specific difficulty in synthesizing between visual and auditory sensory functioning was the cause of reading problems but she did not then have the means to study it.

Teicher (1941) made studies on motility, as taught by Schilder, of 200 children, 4 to 15 years of age, boys and girls, black and white, on the Bellevue children's service in 1938-9. He found a definite progression of the maturation of the motility pattern during childhood. He found this pattern was retarded in children with organic brain disturbance and modified in children with dyslexia as the pattern of dominance and laterality appeared to be conflicted.

Fabian (1945) made a significant contribution when he pointed to the tendency in normal development of young children four to five years of age to rotate figures from the horizontal to the vertical. He noted that this tendency might persist normally to the seventh or eighth year (see design A in Figure 2). Fabian saw this as being related genetically to the maturation to the upright from the prone position in the child and in the body image. Not infrequently a child may continue with a verticalization tendency beyond the normal age. Fabian also related this tendency to the rotation and reversal of letters by such children. He continued his interest in dyslexia in school children, and later (1951) saw it as an ego disability.

Perhaps Katrina de Hirsch is best known for her early predicting and corrective training of reading failures in children (de Hirsch 1966, with Jansky 1972). She was earlier at Bellevue and has repeatedly contributed to the concepts of maturational lag and plasticity in patterning and the usefulness of the Visual Motor Gestalt Test (de Hirsch 1952, 1954, 1965).

A. A. Silver had made the most intensive studies on dyslexic children at Bellevue before 1950 (Silver 1950, 1952). He studied both perception and

motility, using the Hoff and Schilder motility tests (1927) and the Visual Motor Gestalt Test and the Goodenough drawing-of-a-man test. He has continued his studies since then in association with Rosa Hagin (1960,1961, 1974).

In a recent summary (1970) of his work, Silver defined developmental language disability as a "profound defect in spatial and temporal perception . . . visual and auditory modalities and with difficulties in the intermodal integration."

He also stated that since only a third of the children with such a language learning disability were free of organic brain disorders, or retardation, or schizophrenia that only this third should be diagnosed dyslexic. It has been my experience that many truly dyslexic children may also have minimal organic brain disorders, retardation, or schizophrenia. Many children seen professionally, because they cannot cope with their problems, have combinations of several problems. In each case, nevertheless, the dyslexia can and should be recognized and dealt with.

Ilse Goldberg (1952) used remedial tutoring as a form of psychotherapy at Bellevue with schizophrenic children who also had reading disabilities. She emphasized the individuality of each child and the need to work out a specific tutoring therapeutic program for each child. This resulted in improvement of both the reading disability and the schizophrenia. In other words, it appeared to provide a stimulus to overcome the child's maturation lag. She also made interesting observations on temporal and spatial difficulties.

Ralph Rabinovitch (together with Kennard and Wexler 1952) studied the electroencephalogram patterns in Bellevue children with reading disabilities. Later at the Hawthorn Center in Michigan, he and his co-workers classified reading retardations into primary and secondary (1956, 1959). This is now widely accepted, and, of course, there are secondary factors as well as primary ones. Recent work on the educationally and culturally deprived children has indicated that 50 percent of ghetto children are retarded in reading (Silver, 1970). Still, there are 50 percent that are not. This suggests to me that maturational problems are accentuated even in mild cases by the secondary or exogenous factors. Children in whom the secondary problems are critical and the maturational problems mild, respond to tutoring or intensive teaching methods more readily than those whose problems are more seriously endogenous. Children who have no developmental problems acquire reading skills in spite of inadequate education.

Summary of Bender Concepts of Dyslexia

In the 1956 meeting of the Orton Society, I presented a paper on "Problems in Conceptualization and Communication in Children with Developmental Dyslexia" (Bender 1956, 1957) in which I summarized many concepts to which I have added only minor details since.

1. Recent evolution in language has been associated with the expansion of those parts of the neopallium that function to serve language and unilateral manual and ocular dominance. These functions and areas are still not fully stabilized. Therefore, there is a great variabilitity in maturation time and in functioning in these areas in different individuals. Those children who show the greatest variability and retardation in language development have the greatest difficulty in our standardized and competitive educational system. In numbers, they appear to be equally distributed at all levels of intelligence and in all types of linguistic and cultural backgrounds. But their language problem evidently stems from a familial pattern determined by heredity.

We are reminded of Herrick's 1956 teaching that the living brain is a stage in transit in evolution.

Brenda Sladen in the 1973 meeting of the Orton Society also spoke interestingly about evolution in relation to specific reading disabilities with much more data than I have given (Sladen 1974a and 1974b). For both of us this is largely speculation and it is still a problem how it can be documented.

2. Maturation lags characterize the specific language disabilities in children. This is a term I have used since 1940 when it was found that reading disabilities could be predicted in nursery age children who were lagging in several areas of function though they evidently were of normal intelligence (Bender and Yarnell 1941). Maturation lag is related to the evolutionary problem. Maturation lag seems to be more or less specific for language learning problems. It affects cortical dominance for motility and spatial orientation. There may be evidence for lagging maturation in some other motor behavior areas. The patient's personality may also be somewhat immature and therefore more vulnerable to all of life's problems (Bender 1968).

Maturation lag indicates a different, variable, and often slower rate of maturation in one or another of the language functions, in motility, in personality. It is not a defect and it is not fixed. It is a lack of differentiation in patterning retaining some embryonic chacteristics.

In language it may involve variously any of the several language functions: speech, reading, writing, spelling; the several perceptual modalities,

visual, auditory, proprioceptive, and their intermodal integration, as well as symbol formation. Cerebral dominance is often not well established; it may be "mixed" and seems variable from day-to-day. The perceptual awareness of left-right and other spatial orientation is inadequately experienced. There may be difficulties in both the percepts and the concepts of space and time.

Motility shows many variations from the age-established norm. Of course, each personality pattern is unique and influenced by those variations in endogenous functions as a part of life experiences, the way the child's outside world reacts to him and the child's own way of coping.

3. Plasticity in the patterning of functions is a characteristic of maturational lags. This is a concept used by embryologists to indicate a pluripotential capacity for differentiation in patterns characteristic of the embryonic stage of development but which tends to become fixated with maturation. Plasticity is necessary for evolution. If the development of functional patterns becomes fixed or static, further development or evolution in that line of an organism becomes impossible. Plasticity in some way is synonomous with primitivity, immaturity, and maturational lags. It is most evident in recently evolved functions of the human brain such as language and the associated manual dexterity. It is also significant in creativity in the higher intellectual and artistic expressive areas, but it is present at every level of vital functioning, perceptual patterning or Gestalten. It makes possible further maturation or growth and responsiveness to appropriate programs of training, tutoring or therapy (Bender 1966, de Hirsch 1965).

4. The capacity for acceleration in maturation, language learning or intellectualizing is the result of a non-fixated plasticity. I have considered it an integral part of the maturational lag though this sounds like a contradiction. Like every other feature it varies in the ways it finds expression in different children. Many children show a quick responsiveness to available teaching or tutoring. Others compensate without help. Still others show special abilities or precocities in other areas than in the one with the maturational lag. Many children are over-abstract unless this is sacrificed by rote teaching.

In the 1930's Paul Schilder and I (1951) studied the art productions of some children with reading disabilities who showed spontaneous gifts in their art work. On follow-up these children proved to have been decisively responsive to new social and educational opportunities offered them.

Sladen (1972) has pointed out that children with specific language learning disabilities tend to have certain "advantages." Thompson (1971) has

written about the language disabilities in men of eminence. He does not draw the conclusion that language disability may be associated with other accelerated intellectual or creative functions as a part of the total picture, as I would have done.

Other Maturational Lags

Childhood schizophrenia has all the features of a generalized maturational lag, with plasticity (Bender 1955), poor pattern differentiation or boundaries, and areas of acceleration in all vital functions and growth patterns. These functions include visceral, autonomic nervous system, motility, perception, language, thought processes, fantasy, affect, interpersonal relations, anxiety and defense mechanism. There are also hereditary patterns and a characteristic life course (Bender 1973).

There is, however, no relationship between childhood schizophrenia and specific language disabilities except as they happen to occur in the same child, which is not uncommon. If 10 percent to 15 percent of all children have language learning disabilities, one may expect the same incidence in schizophrenic children. If either condition tends to improve—either from spontaneous maturation or as a result of treatment, therapy or tutoring—both conditions, or more significantly the child as a whole person, will improve.

It is also not uncommon to find schizophrenic children with a high level of reading ability (Cobrinik 1974), though perhaps without adequate understanding of content, but rather as an autistic function. This is a plastic or accelerative feature. In the presently recognized schizophrenic spectrum (Heston 1970) there is a group related to schizophrenics called superphrenics (Karlsson 1968)—individuals not entirely unable to compensate for their schizophrenia—who are unusually gifted in some area.

We must remind ourselves again and again that no child has only one problem unless the problem is so overwhelming—such as gross brain damage—that other problems cannot be revealed. One must always assume that there is some degree of organicity, some special hereditary pattern, some maturation problem, some deprivation or traumatic life experiences, and that each child has a unique way of coping with these problems or compensating for them. The main drive is for a normal, or better than normal, life pattern, a constructive contribution to life and society. Otherwise there is trouble and help is needed.

References

Bender, Lauretta. 1928. The cerebellar control of the vocal organs. *Arch. Neuro. and Psychiat.* 19:796-833.

_____. 1935. Anatomopathological data on personality. *Amer. J. Psychiat.*

_____. 1938. *A Visual Motor Gestalt Test and Its Clinical Use.* New York: Research Mong. #3. American Orthopsychiatric Assoc.

_____. 1940. The Goodenough test (drawing of a man) in chronic encephalitis in children. *J. Nerv. and Ment. Dis.* 91:277-286.

_____. 1951. Developmental lags. *Bull. Orton Soc.* 1:3-5.

_____. 1954. Problems in conceptualization and communications in children with developmental alexia. In *Psychopathology of Communication,* eds. P. Hoch and J. Zubin. American Psychopathological Assoc., New York: Grune and Stratton. Pp. 155-176.

_____. 1957. Specific reading disability as a maturational lag. *Bull. Orton Soc.* 7:9-18.

_____. 1966. The concept of plasticity in childhood schizophrenia. In *Psychopathology of Schizophrenia,* eds. P. Hoch and J. Zubin. American Psychopathological Assoc., New York: Grune and Stratton. Pp. 354-365.

_____. 1968. Neuropsychiatric disturbances in developmental dyslexias. In *Dyslexia,* eds. A. H. and V. T. Keeney, St. Louis: C. V. Mosby Co. Pp. 42-48.

_____. 1970. The use of the Visual Motor Gestalt Test in the diagnosis of learning disabilities. *J. Spec. Educat.* 4:29-39.

_____. 1973. The life course of children with schizophrenia. *Amer. J. Psychiat.* 130:783-786.

Bender, Lauretta and Paul Schilder, 1951. Graphic art as a special ability in children with a reading disability. *J. Clin. and Exper. Psychopath.* 12:147-156.

Bender, Lauretta and Helen Yarnell, 1941. An observation nursery. *Amer. J. Psychiat.* 97:1158-1172.

Bonner, A. F. 1917. *The Psychology of Special Abilities and Disabilities.* Boston: Little, Brown and Co.

Bryant, P. E. 1975. Cross modal development and reading-learning. In *Reading, Perception, and Language,* eds. Drake D. Duane and Margaret B. Rawson. Towson, Maryland: The Orton Society (paperback); *also* Baltimore: York Press (cloth).

Cobrinik, L. 1974. Unusual reading ability in severely disturbed children. *J. Aut. and Child. Schiz.* 4:163-175.

Curran, F. J. and P. Schilder, 1940. A constructive approach to problems of childhood and adolescence. *J. Criminal Psychopath.* 2:125-142, 305-320.

Fabian, A. A. 1945. Vertical rotation in visual motor performance in relationship to reading reversals. *Educat. Psychol.* 36:129-135.

_____. 1951. Clinical and experimental studies of school children who are retarded in reading. *Quart. J. Child Behav.* 3:15-37.

Goldberg, Ilsa. 1952. Use of remedial reading tutoring as a method of psycho-therapy for schizophrenic children with reading disabilities. *Quart. J. Child Behav.* 4:273-280.

Herrick, C. J. 1956. *The Evolution of Human Nature.* Austin, Texas: The University of Texas Press.

Heston, L. L. 1970. The genetics of schizophrenia and schizoid disease. *Science.* 167:249-255.

de Hirsch, Katrina. 1952. Specific dyslexia or strephosymbolia. *Folia Phoniatrica.* 4:231-238.

_____. 1954. Gestalt psychology as applied to language disturbances. *J. Nerv. and Ment. Dis.* 120:257-261.

_____. 1965. The concept of plasticity and language disabilities. *Speech Path. and Ther.* 8:12-17.

de Hirsch, Katrina, J. J. Jansky, and W. S. Langford, 1966. *Predicting Reading Failure.* New York: Harper and Row.

Hoff, H. and P. Schilder, 1927. *Die Lage Reflexe der Menschen.* Berlin: Springer.

Jansky, J. J. and K. de Hirsch, 1972. *Preventing Reading Failure.* New York: Harper and Row.

Karlsson, J. L. 1968. Genealogic studies of schizophrenia. In *Transmission of Schizophrenia,* eds. D. Rosenthal and S. S. Kety. *J. Psychiatric Research.* Vol. 6, Suppl. 1.

Kennard, M., R.D. Rabinovitch, and D. Wexler, 1952. The abnormal electroencephalogram as related to reading disabilities in children. *Canad. Med. Assn. J.* 67:330-337.

Meyer, Adolph. 1922. Constructive formulations of schizophrenia. *Amer. J. Psychiat.* 1:355-364.

Monroe, Marion. 1932. *Children Who Cannot Read.* Chicago: University of Chicago Press.

Orton, June L. 1957. The Orton story. *Bull. Orton Soc.* 7:1-8.

Orton, S. T. 1925. "Word-Blindness" in school children. *Arch. Neur. and Psychiat.* 14:581-652.

_____. 1937. *Reading, Writing and Speech Problems in Children.* New York: W. W. Norton and Co.

Rabinovitch, R. D. 1959. Reading and learning disabilities. In *American Handbook of Psychiatry,* ed. S. Arietti. 1:857-870. New York: Basic Books.

Rabinovitch, R. D., A. L. Drew, R. De Jong, W. Ingram, and L. Murphy, 1956. A research approach to reading retardation. In *Neurology and Psychiatry of Childhood.* 34:463-396. Assn. Research Nerv. and Ment. Dis. Baltimore: Williams and Wilkins.

Schilder, Paul. 1931. *Brain and Personality.* New York: International University Press. 1951.

_____. 1935. *The Image and Appearance of the Human Body.* New York: International Universities Press. 1950.

_____. 1942. *Mind, Perception and Thought in Their Constructive Aspects.* New York: Columbia University Press.

_____. 1944. Congenital alexia and its relation to optic perception. *J. Genet. Psychol.* 65:67-88.

_____. 1964. *Contributions to Developmental Neuropsychiatry.* ed. Lauretta Bender. New York: International Universities Press.

Silver, A. A. 1950. Neurological and perceptual survey of children with reading disability. Read at Section of Neurology and Psychiatry, New York Academy of Medicine. April, 1952. (Unpublished).

_____. 1952. Postural and righting response in children. *J. Pediat.* 41:493-498.

_____. 1961. Diagnostic considerations of children with reading disabilities. *Bull. Orton Soc.* 11:5-12.

_____. 1970. Dyslexia: A symptom not a disease. *Hosp. Tribune,* Sept. 7, 1970. P. 9.

Silver, A. A. and Rosa A. Hagin, 1960. Specific reading disability, Delineation of the syndrome. *Compreh. Psychiat.* 1:128-134.

Silver, A. A. and R. A. Hagin, 1975. Fascinating journey: Paths to the prediction and prevention of reading disability. *Bull. Orton Soc.* 25:24-36.

Sladen B. K. 1972. Some genetic aspects of dyslexia. *Bull. Orton Soc.* 22:41-53.

_____. 1974a. The evolution of human capacity for language. *Bull. Orton Soc.* 24:37-47.

_____. 1974b. Review of genetic aspects of dyslexia. Presented Nov. 8, 1974. World Congress on Dyslexia, Rochester, Minn.

Teicher, J. D. 1941. Preliminary survey of motility in children. *J. Nerv. and Ment. Dis.* 94:207-304.

Thompson, L. J. 1971. Language disabilities in men of eminence. *J. Learn. Disability*. 4:34-45.

Wertheimer, Max. 1923. Untersuchungen zur Lehre von der Gestalt. Psychol. Forsch. 4:332-337. Translated in *A Source Book of Gestalt Psychology*. ed. W. D. Ellis. New York: Harcourt, Brace and Co., 1938. P. 71-88.

Fascinating Journey: Paths to the Prediction and Prevention of Reading Disability

Archie A. Silver and Rosa A. Hagin

Archie A. Silver, M.D., is Clinical Professor Psychiatry, and Director of the Learning Disorders Unit, New York University Medical School. Rosa A. Hagin is Research Associate Professor of Psychology, and Co-Director of the Learning Disorders Unit, New York University Medical School.

Once upon a time, a quarter of a century ago, a young psychiatrist, cloaked with the invincibility of his newly completed residency, ventured into the basement of Bellevue Psychiatric Hospital to organize a psychiatric clinic for children. He thought he really understood the problem children and the children with problems who came to him until one day Lennie appeared.

Lennie was ten-and-a-half years old then, a chubby, well-developed boy who kept looking about the examining room with frightened eyes. His mother complained that he could not read and that he would not do his school work. His grades were terrible; he had no friends; and he fought with his younger brother. It was the vogue then to explain learning failure as being due to emotional problems, and Lennie had them, even the inhibition of voyeuristic impulses, feelings of doubt in his own male identity. But Lennie revealed other interesting problems. His IQ on the Stanford-Binet was 106; his classical neurological examination was normal; his visual and his auditory acuity had no defect. His Gestalt drawings, however, were peculiar. Not only did he have the verticalizations described by Fabian (1945), but also his diamond figures were distorted in a peculiar dog-eared way, as though he could not decide on the direction to take when he had to draw an angle. This was a curious performance, the cause of which we were impelled to understand.

With Lennie began our search for the origins of the dog-eared diamond and the stellate angle, a search which has lasted many years and which has led this psychiatrist, no longer young and no longer invincible, together with his

This paper was presented at the World Congress on Dyslexia, Rochester, Minnesota, November 1974.

colleague and co-worker Rosa A. Hagin, Ph.D., into many paths, one step logically following the other from description to follow-up, to teaching methods, to epidemiological studies, to application of their work within the schools, and now to prediction and prevention of the dog-eared diamond and all the anguish it portends.

Lennie was the first of many children with reading problems seen at the Bellevue Mental Hygiene Clinic in those early years. In fact, reviewing our data for 1949 and 1950, we found that a full 80 percent of the children referred to us as emotional and behavior problems were reading one or more years below the level we would expect from their intellectual functioning and their educational exposure. We simply had to understand these children. The dog-eared diamond was a complex clue: Was it simply a sign of disordered visual discrimination? Were the central associational mechanisms askew, or was it that the visual percept could not correctly be executed—namely, problems in praxis or in fine motor coordination? As it turned out, we learned that it could be any or all these factors.

In children with reading disability there was a basic immaturity in orientation in space and in time, found in specific defects in the visual discrimination and recall of asymmetric forms, in visual figure-ground perception, in the production of primitive verticalization and angulation in visual-motor function, in difficulty with the temporal sequencing of auditory stimuli, in body image immaturity, in right-left discrimination, praxis, and finger gnosis. In addition, those postural and righting responses, particularly the tonic neck and the neck-righting responses, were immature (Silver 1952). This syndrome was described in 1950 when the results of a neurological and perceptual survey of 15 children retarded in reading were presented to the Section of Neurology and Psychiatry of the New York Academy of Medicine. This study was followed later (Silver and Hagin 1960) by a controlled investigation of 150 similar children.

Today, of course, this description of the reading disability syndrome is not new. Our contribution was to trace the pervasive influence of basic temporal and spatial disorientation into all modalities of perception, to relate its devastating effect on the learning of language, and to observe its pernicious influence on the developing personality. We found that in any individual child, perceptual defects might appear in any and all combinations involving all varieties of dysgnosias, dysphasias, and dyspraxias; that to understand the struggles of each child, a broad perceptual survey was needed, and that an individual perceptual profile starkly revealing his assets, as well as his deficits,

could be drawn. Just how this was done can be seen from early perceptual profiles drawn in 1950 for Lennie and his 8 to 12 year old peers. The structuring of a perceptual profile has served us well, and to this day perceptual profiles, evolved from more sophisticated testing, graphically demonstrate areas of strength and weakness, illustrating the spectrum of deficits in reading disability and directing in large measure the intervention techniques to be used.

Our early studies, repeatedly confirmed in later observations, not only identified children with reading retardation in accordance with the distribution of perceptual defects, but also made us acutely aware of a distinct and important subgroup—namely, those children who, in addition to the basic syndrome of spatial and temporal disorientation, had neurological signs. Some of these signs were indeed "very soft," involving such minimal cranial nerve abnormalities as eccentric pupils; remnants of tonic neck responses; problems with impulse control; with hyper- or hypokinetic patterns; difficulty with sustained attention; respiratory speech dissociation; poor ocular convergence; immaturities in so-called higher cortical functions, as in ability with abstractions. Some signs were more than soft, involving problems with muscle tone, power, and synergy; with mild facial paresis; deep reflex inequality; ankle clonus; abnormal plantar responses; cogwheel-type rigidities. The numbers of children with these neurological findings are significant, encompassing, in our experience, approximately one fourth of those children retarded in reading.

The importance of these neurological findings is twofold. First, do these signs represent one end of the spectrum of reading disability; i.e., a severe developmental variant, or are they residuals of central nervous system insult, be it traumatic, anoxic, infectious, or genetic? If it is indeed the latter, then we have an important clue as to the etiology of some of the defects found in children with reading retardation and a tool for primary prevention. The pendulum, it seems to me, is swinging now in the direction of recognizing the etiological importance of "soft" neurological signs and not simply dismissing them as normal variants.

The second importance of neurological signs, soft or classical, is in prognosis and in treatment. As we shall see, in these children perceptual deficits are more pervasive, more tenacious, and more resistant to treatment than in children with reading retardation without these neurological signs.

Our description of the syndrome would not be complete if we did not

mention the problem of cerebral dominance. If we interpret the multitude of perceptual defects as resulting from disorientation in space and in time, we must ask what causes this basic, specific disorientation. Our attempt to carry our understanding of these perceptual defects one step further leads us to hypothesize that defects in spatial and temporal orientation may in themselves be caused by the lack of clear-cut cerebral dominance for language or by a defect in the functional asymmetry between the two hemispheres. Suggestive evidence that cerebral dominance is important in reading disability has been advanced by McFie (1952), phi phenomena, and by Kimura (1963), dichotic auditory stimulation. Our own efforts have been to utilize the arm extension test of Hoff and Schilder (1927). Here, on extension of the arms, it is noted that in children above 6 years of age, one arm is held higher than the other. We have admittedly extrapolated the significance of this event far beyond that stated by Hoff and Schilder, but we have offered the suggestion that the elevated extremity might indeed be responding to the tonic forces of a dominant cerebral hemisphere. Where the elevated extremity does not conform to the hand used for writing, then we suspect that clearcut cerebral dominance for language is not established.

This suggestion was first published in 1952, and we have, since then, repeated evidence of its empirical value. We can, for example, go into a third grade class, select those children whose elevated extremity on the extension test does not conform to their writing hand, and be reasonably certain (nine out of ten) that we have selected retarded readers. Conversely, in a study of 100 third or fourth grade children in a suburban school in New Jersey, 41 were found to be reading below their mental age and grade placement. Thirty-four of these had a discrepancy between elevated extremity on the extension test and the hand used for writing. Seven children, reading below expectancy but with consistent writing and elevated hands, did not have the perceptual problems seen in our basic syndrome and may fit into a different etiological category than the majority of children with reading retardation.

Of course, these are empirical findings. In our studies the extension test does point to language retardation; on the other hand, the so-called "mixed dominance" of eye, hand, and foot preference has no relationship at all. Assuming that our interpretation is correct, however, why should a child with language disability have equivocal cerebral dominance for language? A partial answer to this question has been advanced by Lauretta Bender, who argues that phylogenetically language is the last skill acquired by man. As such, it is

most vulnerable, being influenced by genetic factors, by minimal structural damage to the central nervous system, by physiological stress, or by lack of specific stimulation during critical ages for perceptual development.

Theoretically, to be consistent with our hypothesis, the teaching of reading should begin with the establishment of a clear-cut cerebral dominance for language, or better still, we should go back to the first year of life, establishing there a preferred direction of tonic neck reflex, thus enhancing very early the neurological substrate of functional asymmetry. It may be that it is in the first year of life that we must look for the origins of a language disability. We have yet not reached that stage, but we can with reasonable reliability and validity predict by age five years which child will or will not have difficulty with reading.

This is a bit ahead in our journey. We have until now seen how our search for understanding the dog-eared diamond led to an awareness that in children with reading disability, there is a broad spectrum of perceptual deficits in all perceptual modalities, all stamped with the mark of spatial or temporal disorientation and possibly all leading back to lack of clear-cut cerebral dominance or to a functional imbalance between the two cerebral hemispheres. We have seen the need for a broad perceptual survey and the structuring of a perceptual profile for each child. We have seen also the importance of identifying those children with reading disability who have, in addition to the basic syndrome, neurological signs which give us clues as to etiology and treatment. We have also hinted that an occasional child with reading retardation will show no perceptual defects or organic signs, as detected by our tests.

But with all of these findings, what has happened to Lennie? From 1949-1950, he, along with 40 of his 8 to 12 year old peers, participated in a tutoring program at the Bellevue Hospital Mental Hygiene Clinic. Ten to twelve years later, in 1961-62, it was possible to obtain information on 84 percent of this group and to examine once again 24 (59 percent) of them. We were interested in knowing what had happened to the perceptual and neurological immaturities that we had found when they were children and in evaluating their overall educational and social adjustment.

Our findings revealed that in spite of maturation or of effective use of cues in some areas—right-left discrimination; rotation and verticalization in visual-motor function; clinical, not statistical, improvement in finger gnosis—reading disability is a long-term problem, the signs of which may be detected in perceptual and neurological function, even into adulthood. This is despite

adequate educational, vocational, and social functioning. Problems in the extension test, angulation errors on visual-motor function (the dog-eared diamond is flattened out, but the errors can still be found), persistent figure-ground difficulty in the visual and in the tactile modalities, a persistent motoric response to auditory stimuli—all of these errors remain.

When we compared reading disability children who showed "organic" signs with those without "organic" signs, we found that the "organic" child has more severe perceptual errors in childhood, retains his perceptual defects with great tenacity into adulthood, and he tends to remain an inadequate reader.

Our follow-up study suggested that children will not spontaneously grow out of their perceptual and neurological immaturities and that we simply cannot wait for the maturation, which may never occur and which at best may occur too late, after the wave of educational failure has already engulfed the child. We suggested in 1964 that it may be necessary to devise new teaching procedures appropriate to the pattern of the child's neurologic and perceptual deficiencies (Silver and Hagin 1964).

The next step on our journey was to heed our own admonition and to devise and test a training method based upon the pattern of neurological and perceptual deficiencies which our diagnostic evaluation revealed. This training method was to be a direct attack on these perceptual defects, an attempt to train them out by direct, persistent stimulation. Our hypothesis was that we could indeed enhance perceptual maturation, could accelerate the maturation of lagging function, and so induce the neurophysiological levels we believe necessary for reading. It follows, therefore, that with increased accuracy of perception, we hypothesize that oral reading will also improve.

This part of the journey, devising and testing methods of specific perceptual stimulation, was a long and arduous one, involving as it did so many variables and forcing us to complement our clinical judgments with harsh, objective statistics. A controlled study involving 80 boys, ages 7 years to 12 years, 11 months, with IQs on the Wechsler Intelligence Scale for Children (WISC) varying from 80 to 132 and all referred to the Bellevue Hospital Mental Hygiene Clinic for emotional and/or behavior disorders, was finally done and detailed in a report to the Carnegie Corporation in 1972. A preliminary report appeared in the *American Journal of Orthopsychiatry* in 1967.

The experiment involved two groups of 40 boys each, with the boys paired on the basis of age, IQ, reading level, and neurologic and psychiatric

diagnosis. One individual of each pair was assigned randomly to Group I; and his partner, to Group II. The experiment was designed so that each child was to have two training sessions each week for a total of 100 sessions. Each session was an individual one with the same teacher, each lasting for about 45 minutes. For the remainder of his school day, the child continued his regular classes in public or parochial school. For the first 50 sessions of the experiment, Group I received perceptual stimulation; for the second 50 sessions, Group I received "contact" appointments, in which the child was tutored in the appropriate level of a basal reader, using conventional teaching procedures. For those in Group II, the procedure was reversed; they received "contact" appointments for the first 50 sessions, perceptual training for the second 50. This crossover design minimized the effect of spontaneous maturation and permitted each child to serve as his own control as well as permitting group contrasts. The training techniques used in this experiment were directed at improving accuracy of perception and awareness of body image in space through single channel input, taking only the deficit perceptual area and attempting to modify it by direct training. In the visual modality, for example, accurate spatial discrimination is taught by the process of visual recognition of simple forms, then of asymmetric forms and matrix-like forms. It is impossible, of course, to demonstrate each of these techniques in this paper. We have defined each, however, in terms of purpose, materials, content, procedure, and mastery criteria and have collated them in an instruction manual.

The results of this experiment suggested to us that we can indeed train out perceptual inaccuracies relating to spatial and temporal orientation and that, in the 7 to 12 year old boys we treated, increased accuracy of perception was accompanied by improvement in oral reading and in reading comprehension. Parenthetically, in those children in whom perceptual accuracy was attained, our tests indicated a trend toward the establishment of clear-cut cerebral dominance.

A word of caution, however, goes with these findings. Deficit perceptual training was not intended to be a method for teaching reading. It is only a basis for reading; however, it is a basis essential to word recognition. A complete reading program must involve, in addition, intermodal and verbal levels to relate perceptual modalities and to transfer perceptual ability to language skills. Our results suggest, however, that where perceptual defects are first trained out, instruction at intermodal and verbal levels has a better chance of success.

At this point we began to think seriously about prevention. We had

developed a principle; namely, that we could enhance neurophysiological maturation and that this maturation was accompanied by improved ability in oral reading. Now if we could offer perceptual training at the critical ages when perception normally develops, could we prevent deficits in those perceptions later on and thus enable the child to grasp intermodal and verbal material in the first grade?

As we stop and look back a moment over our attempts at delineating the syndrome of reading disability, at our follow-up studies, and at the experiments involving the stimulation of deficit areas, we note that all these studies were done with children referred to the Mental Hygiene Clinic for behavior difficulty and emotional problems. We had been dealing with a selected population, possibly the most difficult in terms of management and treatment. In them the inevitable school failure had already established fixed resistance to learning and had contributed in great degree to their emotional and behavioral decompensation. We felt that we had to reach these children before they needed a psychiatric clinic. Ideally we should detect vulnerable children at birth or even before birth; however, practically we were content for the moment to set our goal more modestly at the first grade. We chose first grade because it is here that the child's cognitive skills begin to focus on reading. Here our tests were able to predict with reasonable certainty which child would have reading difficulty, and here we could still interrupt the destructive influence of reading failure.

In 1969, therefore, we attempted to apply our knowledge within the schools, and a program for the prevention of learning failure and its emotional consequences was then initiated by our Unit with the cooperation of parents, teachers, and administrators of a public school in the Kips Bay area of Manhattan.

This program had many facets. First, it was designed as a cross-sectional survey of the first grader, the 6 to 7 year old; it was an epidemiological survey based on individual psychiatric, neurologic, perceptual, psychological, educational, and social evaluation of every child in the first grade. Results of these examinations could tell us the nature and extent of emotional problems, the neurological and perceptual deviations seen in the normal 6 to 7 year old, and so supply firm data for school planning as well as detailed information for appropriate intervention for each child. Just as we had a perceptual profile for each child, we now had a neuropsychiatric profile for the entire first grade. These very basic data had never been obtained previously. Parenthetically, these data are a contribution to child development, not only in obtaining a multitude of cross-sectional information on the 6 and 7 year old, but also as

we follow our first grade into the succeeding years, we can add cross-sectional information at ages 8, 9, 10, and 11; and then we could tie them together in longitudinal studies of groups and of individuals. This material has been gathered and remains in our files to be studied.

The preventive program had other facets, of course. With the data obtained through individual examinations, we could select those children for whom we predicted reading failure. Our criteria for such a prediction were, first, the presence of perceptual deviations in spatial and temporal orientation, evidence that cerebral dominance for language was not established, deviations in praxic ability and in fine motor coordination. Children meeting these criteria encompassed approximately one third of the total number of children in the first grade of the Kips Bay School. Evaluating a range of ego functions of our first grade, we found that 12 percent of the total group already had symptoms suggesting emotional decompensation; 25 percent were considered well adjusted; and the remaining 63 percent had mild or moderate symptoms which indicated emotional stress, compensated but vulnerable. Details of our findings in the first grades of two successive years, 1969-70 and 1970-71, have been published (Silver and Hagin 1972).

The detection of children vulnerable to educational failure and to emotional decompensation led to the third aspect of the program—namely, intervention. For those children with a vulnerable neuroperceptual apparatus, a resource room was established, manned jointly by one of our supervising teachers and a teacher assigned from the Kips Bay School. In this resource room the child received perceptual training based upon the principles described above. The children remained in their regular class and came to the resource room for 15- to 20-minute sessions daily. For those children with mild or even moderate emotional problems who had, in addition, perceptual immaturities, success in learning provided a strong point around which the developing personality could rally, and further psychiatric intervention was not needed. For those already emotionally decompensated, psychiatric help was provided. The intervention program, however, was more than direct work with children. It involved also group work with parents and, most importantly, a close working relationship with teachers and administrators of the school. As indicated, we did not attempt to teach reading. All we hoped to do was to make the child ready to learn to read. The close cooperation with first and second grade teachers was particularly necessary to convey our understanding of the child to the teacher, to suggest methods of management and even methods of teaching.

Our work in the Kips Bay School continues to this day, suggestive evidence that this type of preventive program is feasible and successful. It has been replicated in four other schools in the Murray Hill and East Side Catchment Areas of New York City, has been extended to include a nursery for 3 to 5 year olds, and has been adapted to projects in other parts of the country.

The preventive programs have another important implication—namely, that the neurological and perceptual deviations found to be associated with school learning problems are so numerous, approximately one third of the total first grade population, that the needs of these children cannot be met through isolated programs or special classes. Provision for them must be incorporated throughout the educational system. It will be noted, further, that examination and intervention take place within the schools themselves, with the Medical Center utilized only for more laboratory-type investigations: electroencephalograms, X-rays, chemical and genetic studies.

Expansion of this type of intensive, preventive casefinding and intervention, however, creates problems. First, clinical services are not only expensive, but also they are not always available. Second, this program is truly interdisciplinary, involving responsibilities of the Board of Education, the Departments of Health and of Mental Health, the Medical Center, and private foundations. To put together the financial jigsaw puzzle to fund such an interdisciplinary project requires that the walls between departments and boards be breached, a task demanding a persistent heart and understanding creditors. Yet the prevention of learning failure is a high priority need. Our solution to the dilemma of ever-expanding services and of ever-expanding cost, on the one hand, and of preserving the precision of detection and the cues for intervention available in the original intensive examinations, on the other, was to plan a two-stage diagnostic process.

The first stage would utilize a general scanning instrument which could be administered individually to every child in the spring of his kindergarten year, which would require approximately 15 to 20 minutes per child, which could be administered by specially trained school personnel, and which could locate children vulnerable to learning failure. The second stage would be an intensive clinical examination for only the vulnerable children, to pin down the cause of the potential failure.

Such a Search Battery is now available. Based upon factor analysis of the data accumulated in the years of our intensive examination programs, standardized with 534 children from six kindergarten grades of four different

schools in lower Manhattan, a Kindergarten Search Battery has been developed. The Search Battery contains ten subtests measuring perception in the visual, auditory, and intermodal modalities and, in addition, adds information from the neurological examination—namely, maturation in body image as evidenced by spatial orientation, finger gnosis, and praxis (pencil grip). Specifically, the subtests are visual discrimination, visual recall, visual motor ability, auditory discrimination, auditory sequencing, intermodal dictation, articulation, directionality, finger gnosis, and pencil grip. For each subtest, a cutoff score, delineating those children deemed vulnerable in the function measured by the subtest, was set at the lowest one third of the distribution. We could then add the number of subtests scoring above the designated vulnerable scores to yield a total Search score. For example, a total Search score of 10 indicates that a child exceeded the vulnerable scores in all subtests; a score of 4 indicates that only four tests exceeded the vulnerable scores.

Statistical analysis of the internal consistency, test-retest reliability, concurrent and predictive validity of the Search Battery have been presented to the American Psychological Association, to the American Academy of Child Psychiatry, and in a manual of procedures.

Review of the total Search scores for the six kindergarten grades reveals that a total Search score of 5 or below delineates the lowest one third of the group. A Search score from 0 to 3 encompasses approximately 11 percent of the group. It is to be expected then that without intervention, those children scoring at 5 or below will be vulnerable to educational failure. Actually, in a control school (Lower East Side), where no intervention program was introduced, a correlation of .62 ($p < .01$) between total Search score at the end of kindergarten and Oral Reading score (Wide Range Achievement Test) one year later suggests a relationship between Search and the skills needed for word identification. Further, when the control group was dichotomized at the median reading score obtained by the group at the end of first grade, no child with Search score 5 or below placed above the median in Oral Reading; of those with Search scores of 6 and 7, 38 percent placed above the median; of those with scores of 8 to 10, 87 percent scored above the median. If we now study the relationship of total Search score to intensive clinical diagnosis, we find that, in general, with Search scores 0 to 3, neurological signs are found in approximately 80 percent; with Search scores 4 and 5, we find a developmental language disability in 70 percent; with Search scores 6 and 7, significant emotional problems uncomplicated by neurological or develop-

mental defects are found in 50 percent; at Search scores 8 to 10 no deviations are found.

Therapeutically, at Search scores 4 and 5 educational intervention may immediately be initiated, with confidence that it will meet the child's needs. At 0 to 3 neurological study is indicated; at 6 and 7 exploration of intrapsychic and family dynamics is suggested.

With the Search Battery then, two teachers trained in its administration can go into a kindergarten class in late spring and in two days examine individually each child in that class. With the information thus obtained, they can predict which child will fail to read at the end of first grade, and they will also know what intervention that child needs. In September of the first grade the child can immediately receive the training he needs. Where cognitive intervention is primary, a resource room similar to that in the Kips Bay School is available in each school to provide for deficit perceptual training.

We have reached the stage in our journey where the Search Battery is ready for general dissemination and where the Medical Center should turn over the administration of Search and the staffing of resource rooms to educators. Our role now should be one of supervision, training, consultation, continued monitoring in the dissemination and improvement of Kindergarten Search, and the development of even better predictive measures for even younger children.

Lennie and all of his peers have led us on a challenging and fascinating journey, starting with one dog-eared diamond drawn by one frightened child in a psychiatric clinic. This journey has wound through many paths: searching for a common syndrome, testing new ways of treatment, reaching into the schools for epidemiological data, and arriving now at the place where we can predict reading disability with some certainty and apply our skills to prevent the cognitive and emotional consequences in the thousands of children who still draw the dog-eared diamond.

We are very grateful to Lennie and all of his peers for leading us on this challenging and fascinating journey, one which has already taught us so much but one which really has just begun, directing us into unknown paths which we must explore in the future. And so begins a new journey.

References

Fabian, A. A. 1945. Vertical Rotation in Visual Motor Performance: Its Relationship to Reading Reversal. *J. Educ. Psychol.* 36:129-154.

Hagin, R. A. and A. A. Silver. 1971. Ability Assessment and Training: Neither Nostrum Nor Panacea. *J. Spec. Educ.* 5:35–39.

Hagin, R. A., A. A. Silver, and C. J. Corwin, 1972. Clinical Diagnostic Use of the WPPSI in Predicting Learning Disabilities in Grade One. *J. Spec. Educ.* 5(3):221-232.

Hagin, R. A. 1973. Models of Intervention with learning Disabilities: Ephemeral and Otherwise. *School Psych. Monograph.* 1:1-24.

Hoff, H., and P. Schilder, 1927. *Die Lage Reflexe des Menschen.* Berlin: Springer.

Kimura, D. 1963. Speech Lateralization in Young Children as Determined by an Auditory Test. *J. Comp. Physiol. Psychol.* 56(5):899-902.

McFie, J. 1952. Cerebral Dominance in Cases of Reading Disability. *J. Neurol. Neurosurgery, and Psychiatry*, 15:194-199.

Silver, A. A. 1950. Neurological and Perceptual Survey of Children with Reading Disability, presented at Section of Neurology and Psychiatry, New York Academy of Medicine, April.

Silver, A. A. 1958. Behavior syndrome associated with brain damage in children. *Pediatric Clinics of North America.* pp. 687-698.

Silver, A. A. 1961. Diagnostic Considerations in Children with Reading Disability, *Bulletin of the Orton Society* 2:5-12, (also in *Bulletin of the Orton Society* 13:91-100, 1963; and reprinted in *Children with Reading Problems*, ed. G. Natchez, New York: Basic Books. 1968.)

Silver, A. A., and R. A. Hagin, 1960. Specific Reading Disability: Delineation of the Syndrome and Relationship to Cerebral Dominance. *Comprehensive Psychiatry* 1:126-134.

Silver, A. A., and R. A. Hagin, 1964. Specific Reading Disability: Follow-up Studies. *Am. J. Orthopsychiatry* 34:95-102; reprinted in *Bulletin of the Orton Society* 14:8-15, 1964.

Silver, A. A., and R. A. Hagin, 1967a. Specific Reading disability: Teaching by stimulation of deficit perceptual areas. *Am. J. Orthopsychiatry* 37(4):744–752;

Silver, A. A., and R. A. Hagin, 1967a. Specific REading Disability: Teaching by Stimulation of Deficit Perceptual Areas. *Am J. Orthopsychiatry* 37(4):744-752; reprinted in *Annual Progress in Child Psychiatry and Child Development*, eds. S. Chess and A. Thomas. New York: Brunner. 1968; also reprinted in *Orthopsychiatry in the School*, 1971.

Silver, A. A., and R. A. Hagin, 1967b. Strategies of Intervention in the Spectrum of Defects in Specific Language Disabilities. *Bulletin of the Orton Society* 17:39-46.

Silver, A. A., and R. A. Hagin, 1970a. Visual Perception in Children with Reading Disability. In *Early Experience and Visual Information Processing in Perceptual and Reading Disorders*, ed. Francis Young. Baltimore: Johns Hopkins Press, National Academy of Sciences, Washington, D. C.

Silver, A. A. and R. A. Hagin, 1970b. The History of a Language Problem in an Organic Child. In *A Casebook on Reading Disability*, ed. A. Harris. New York: David McKay.

Silver, A. A., and R. A. Hagin, 1972a. Profile of a First Grade: A Basis for Preventive Psychiatry. *J. Am. Acad. Child Psychiatry* 11:645-674.

Silver, A. A., and R. A. Hagin, 1972b. Effects of Perceptual Stimulation on Perception, on Reading Ability and on the Establishment of Cerebral Dominance for Language. Final Report to Carnegie Corporation.

Silver, A. A., and R. A. Hagin, 1975. *SEARCH: A Scanning Instrument for the Identification of Potential Learning Disability.* New York: New York University Medical Center.

Silver, A. A., and L. Whitsell, 1970. Etiology and Classification of Reading Problems. In *Report of Interdisciplinary Committee on Reading Problems*, A. Silver and A. Hayes, eds. Center for Applied Linguistics. Washington, D.C.

Tutorial and Group Instruction in a Hospital Language Research Unit

Aylett Royall Cox

Texas Scottish Rite Hospital for Crippled Children
Dallas, Texas

This paper introduced a day-long Institute presented at the twenty-fifth annual conference of the Orton Society held at the Mayo Clinic in Rochester, Minnesota, in November 1974. The Texas Scottish Rite Hospital for Crippled Children in Dallas was the setting for the development of the remedial language training program described herein. Based on the hypotheses set forth in the Samuel T. Orton studies of children with a language learning difference, the Scottish Rite programs incorporated appropriate and current theories from neurology, psychology, psychiatry, linguistics, and education. Approximately 1000 elementary and middle school children have passed through the Language Research and Training Laboratory since its inception in 1965.

Described in the text of the paper are the rationale, curricula, and structured teaching procedures developed at the Hospital. Guidelines are included for selecting eligible students and teachers; for teaching the language skills of reading, writing, and spelling; for measuring student progress; and for training the language therapist.

Statistically-based conclusions have yet to be fully established in regard to either the initial procedures leading to precise identification of the children or to the proven success of the teaching. Subjective observation and judgment combined with an ever-increasing number of applicants and cooperating schools provide empirical evidence of success and sustain incentive and justification for the staff's effort until the completion of scientific research.

This paper was presented at the World Congress on Dyslexia, Rochester, Minnesota, November 1974.

Basic Premises

Ten years of studying the language learning process in children with specific developmental dyslexia have produced more questions than definitive answers for the staff in the Language Unit, Neurology Division, of the Texas Scottish Rite Hospital in Dallas. The multidisciplinary team is made up of physicians, psychologists, social workers, speech therapists, and educators. Hundreds of children have passed through the Language Research and Training Laboratory since its inception in 1965; most of them are now functioning adequately at or above grade level with a new and more positive self-image. These success stories seem to support the following basic premises: (1) that self-image in school-aged children depends to a large extent on school performance; (2) that school performance in normal American children predominantly requires the ability to read, write, and spell the English language; (3) that this ability is acquired in the regular classroom by the majority of students; (4) that there is a group in every classroom who have low inborn aptitude for recognizing instantly and remembering permanently two-dimensional symbols; and (5) that these latter children, if appropriately taught, can learn to acquire the secondary language skills (spoken language being primary), of reading, writing, spelling, and verbal expression while they are developing academic knowledge and skills through other media.

Population

An average of one hundred children aged seven to fifteen years attended daily one-hour sessions in the Language Laboratory each year. There is always a predominance of boys in the population. Each of these children has persisted in the program for a minimum of twenty-four months, a few for as long as five years. These children attend classes in their regular public, private, or parochial schools for the remainder of the school day. All are medically referred to the program and individually evaluated in the Neurology Unit of the Hospital. There are no charges for the services, but each family has qualified for a scholarship. In each case the staff believes that the child will benefit from the program's complete retraining of his secondary language skills through a sequenced, multisensory, structured presentation.

The population is always reasonably homogeneous in that none of the children suffers from cultural or nutritional deprivation. The families' participation in transporting the children to and from the Laboratory indicates a

degree of dedication and commitment. Cooperation of the schools involved is inherent, as the training is scheduled during the academic day. The teachers' understanding and support varies among the participating schools and school districts.

Initial Evaluation

In each term during the past 10 years only those children who were physically and intellectually normal have been chosen for the program. Each child was examined medically; his intelligence quotient was measured on a Wechsler Intelligence Scale for Children; and he was rated on a battery of standardized tests which measured the level of his current functioning in reading, writing, and spelling. A customary finding of emotional distress noted during the evaluation was believed to stem from an unsuccessful, frustrating school experience. Children who displayed over-riding primary emotional or neurological involvements were scheduled for further clinical evaluation. Primary speech, eye, ear, or motor problems were referred to the most suitable community resource.

Although many of the children during the testing displayed a tendency to reverse, rotate, transpose, substitute or confuse letters or speech sounds, in reading, writing, spelling, or speaking, in many other children these obvious signs of language disorder were lacking or had been obliterated by the child's high academic motivation or by good teaching at the primary level or both. The most predominant common characteristic among the children selected for the program was scoring on standardized reading, writing, and spelling tests which was not commensurate with their expected achievement as projected by their scores on the Wechsler Intelligence Scale for Children.

Other common traits were (1) poor school grades in the subjects dependent on language and (2) family histories indicating a parent or sibling with difficulty in reading, writing, spelling, or speech.

Placement in the Language Laboratory

Applications of all children evaluated throughout each year are regularly deferred and the children placed initially in the program the following summer. A seven-week summer placement and diagnostic session in the Language Laboratory enables the staff to gauge the children's rate of absorption, their behavioral response to the training, and the degree of their

progress. A positive response to this session results in the child's long-term fall placement in one of eight homogeneous groups each composed of six to eight students. Factors considered in grouping are age, grade, ability, and level of language skills. No new students are added to the modules during the year but a child can be advanced to a faster-moving group if his learning accelerates, or he can be moved into a slower group if his pace begins to lag. Either lack of progress in the program or behavior which consistently interferes with another's learning prompts a staff conference and further investigation of the student's placement. Throughout the years there has been an attrition rate of about 5 percent. Satisfactory progress in the first year enables the student to return to the Language Laboratory the following fall to continue remedial language training.

A meeting is held prior to each term's work in which parents, children, and staff discuss the goals, limits, and specific plans of the program. Regular weekly meetings for parents, led by the staff in the Psychology Department, provide continuing support and guidance for home management of the students.

Structured Teaching Procedures

All material is structured, sequenced, and presented to the small classroom group as a whole. The pace of the group's progress becomes, thereafter, the responsibility of each of its members. All lessons are planned to promote every student's daily success at the 95 percent level. Correct answers are marked and praised. Incorrect answers are noted by the therapist and incorporated into lesson planning but they are never marked nor emphasized. Clear succinct, multisensory directions and a minimum of adult verbalization enable the therapist to engage every student's full interest and cooperation while taking inventory of his linguistic knowledge. Teaching each new concept through discovery, science, and logic stimulates the student's involvement in the learning experience and encourages his assumption of the initiative for expanding his own skills.

Each one-hour session is structured to include ten different activities in the same daily sequence. The schedule of activities is posted in each module in cartoon form (to preclude the necessity for the student to read words) and is referred to regularly by the therapist, students, and trainee assistants. Each activity is planned to encompass a two-to-ten minute period in order to accommodate to the short attention span of most students. Emphasis is

deliberately alternated among modalities (visual-reading, auditory-spelling, kinesthetic-handwriting) and times are gradually elongated, in an effort at first to prevent the student's tiring and then to stretch his ability to sustain concentration and interest in all areas.

Daily Schedule of Activities

Activity 1—Language

The first few minutes of each hour are spent in studying some aspect of the development of oral or written language. The staff has discovered that both the student's familiarity with the history of the development of language in man and his realization that language learning talent is on a continuum like that of art or music are essential to establish his willingness to "submit" to remediation. He is deliberately led to understand and to believe (1) that language learning is a special skill which is not related to intelligence except in current culture; (2) that he has other compensatory talents, often in the area of art, construction, or mechanics, which demand the ability to think and create in three dimensions and (3) that he can learn to read, write, and spell eighty-five percent of standard English if he learns the scientific alphabetic-phonetic code on which the bulk of the language is based. These emphases, presented daily in early training, can be minimized later but their importance merits the therapist's periodic review of all three concepts throughout training.

Activity 2—Alphabet Sequence

At least three minutes is spent daily for alphabet study and drill. Since most children evaluated at the Hospital are at first unable to use the alphabet as a sequencing tool, accuracy in visual recognition and in naming the letters is emphasized and expanded. This training leads naturally into the efficient use of the dictionary, telephone book, card file index system, and many other aspects of American culture. The student who cannot retain easily the visual configurations of words must rely on his facile use of the dictionary throughout his life.

Through tactile manipulation of three dimensional block capital letters in early training, the students acquire skill in form perception, directionality,

and spatial orientation. These concepts are thus both cognitively and in intermodal habits related to their practical application in a society which is oriented left-to-right and is based as heavily on the alphabet sequence as it is on the number system. Rhythm and accent are introduced in oral drill. No part of early alphabet training requires reading, writing, or spelling. Only in the last stages of language training are the students encouraged or even allowed to read the *small* print in the dictionary. As in all other activities, the therapist takes frequent inventory of the student's knowledge and skill in using the alphabet. Gaps are filled and insecure areas are strengthened, but nothing is skipped. Each group progresses as fast as possible through the sequentially arranged material.

Activity 3—Multisensory Introduction of a New Letter

In another kind of presentation in the daily lesson each letter of the alphabet and the most common letter clusters are introduced for reading, writing, and spelling through eight intersensory linkages. The order of the letters' introductions is chosen to separate widely the easily confused configurations and/or speech sounds for which they stand. Every letter of the alphabet and the regularly recurring letter clusters are introduced, one each day, through the student's eyes, ears, and muscles simultaneously. He links the letter's name, shape, sound and "feel" in the muscles of his shoulder, arm, and mouth when he names the letter he sees, writes the large cursive shape, and enunciates the speech sound which it represents. Every activity features the letter's most stable property, its name. Through an individually planned emphasis, the strongest pathway to learning takes the lead for each student and the weaker pathways are strengthened. Experience has demonstrated that auditory, kinesthetic, and visual discrimination and memory can be developed and advanced to a usable level through regular, deliberate use and reinforcement. A few of the children in the Language Laboratory actually learn to read through handwriting and spelling, oral and written when visual stimuli seem in the early stages to interfere, and confuse them. Though intricate to teach, knowledge of the phonic code has proven to be the most efficient tool for the language learner who fails to recognize many words as whole configurations or seems unable to deduce the sound-symbol connections for himself.

Activity 4—Review of Graphemes and Phonemes

Graphemes and phonemes which have been previously introduced are reviewed daily throughout training. Because the bright children in the Language Laboratory are understandably bored with the prolonged repetition and drill necessary for them to absorb fully and permanently the newly learned multisensory letters, the staff's greatest challenge has been to devise ways of enlivening the reinforcement activities. A series of brief daily presentations has been developed which has proved to be both engaging for the children and adequate to implant the basic phonic elements for working out words which are not visually familiar.

1. As each symbol becomes part of his repertoire, the student trains his eyes to identify and name instantly each grapheme which is printed in lower case letters on a separate card and shuffled daily to insure a random order of presentation. The Gillingham cards are used for this activity.

2. He recognizes each letter or letter cluster (presented again) and translates the single graphemes into speech sounds for reading, using key words to remind him reliably of the symbol-sound association. Cards used for this activity have been published and are referred to as the Initial Reading Deck.

3. The student translates each single speech sound or phoneme, pronounced by the therapist, into the grapheme or letter which most often represents the sound in initial, medial, and final positions in English base words. Cards designed to guide the therapist through this activity are available and referred to as the Instant Spelling Deck. The students echo each sound in order to "feel" the placement in the mouth muscles, name the most frequent spelling, then write the letter or letters on paper, on chalkboard, or in the air. Through these daily spelling procedures the letter's four properties are repeatedly linked sensorially, and integrated for the student's permanent absorption.

In this way the most essential elements are extended from the letters' multisensory introductions and practiced daily until the student's reactions are automatic and instantaneous, for practical use in reading, spelling, and handwriting. A student's assurance grows as he realizes that the bridges which he has built among his learning pathways have provided alternative routes to his memory. Although they may take many words to describe, no one part of this activity requires more than three minutes each day.

Activity 5—Reading Practice

Each day the student practices his ability to apply the code to a reading experience. Neither comprehension nor speed can be developed fully in reading until the student's accuracy in decoding has been established and has become an automatic skill. Habits of skipping, guessing, or inserting letters and words must be broken. Practical daily application of the Reading Deck within the Gestalten of words is the most important aspect of each session. Students practice until they can demonstrate skill in reading monosyllables, multisyllables, sentences, and paragraphs accurately while gradually building confidence and fluency as well as vocabulary with the addition of each new letter-sound element. Emphasis is also placed on reading nonsense syllables and words, in preparation for reading upper high school material in which many words, unfamiliar when seen, can now be recognized as a part of the student's vocabulary of auditory recognition when he pronounces them correctly aloud.

Comprehension skill is emphasized in each session through listening while the therapist reads aloud. When, later in training, the student's fluency in decoding reaches an automatic level, his central attention is freed to monitor his own reading. Vocabulary building with affixes and Latin roots is then incorporated into the complex task of teaching comprehension. Speed is never emphasized in the program. Ultimately the training in phrasing and fluency seems to combine with automatic accuracy in decoding to accelerate the rate of most students' reading.

Activity 6—Handwriting Practice

Daily handwriting practice places emphasis on "telling his hand what to write," or naming each letter before writing it. In this way the student is assured that his hand will seldom "trick" him and he can catch his own errors through more expert proof reading. Although laborious to establish, this habit will fortify him for life against "thinking" one letter and writing another.

Approach strokes for cursive letter shapes are important as they all begin on the base line and guide the writer's hand in the desired direction toward each letter's unique configuration. Kinesthetic discrimination and memory can be developed to a usable level and prove often to be the "trigger" which activates visual memory for reading or auditory memory for spelling.

Large letters written on the chalkboard or on unlined paper prove to be especially useful in early training, as does "skywriting" in a standing position, to activate the muscles of the upper arm and shoulder and to implant a strong neurological memory. Cursive writing is used exclusively because it encourages left-to-right progression and it discourages reversal tendencies in letter shapes and sequences. The writing-frame, a wire device for positioning hand and pencil, made available by the Zaner-Bloser Company of Columbus, Ohio, is helpful in training the student to develop good pencil grip and arm movement.

Handwriting practice continues for every student throughout training. For those advanced older students whose poor eye-hand coordination continues to prevent their complete success in writing easily and legibly, a multisensory typing course is a valuable adjunct. Students who have formerly failed to pass a traditional typing course can usually learn the keyboard in about twenty hours of instruction and soon advance the skill to a usable level.

Activity 7—Spelling Practice

Daily practice in the use of the Instant Spelling Deck supports the student's practical application of the sound-symbol relationships in the classroom. Study of the most probable phoneme-grapheme correspondences in the spelling of words and sentences begins with the first letter, *I*. As other letters are added, the words become increasingly complex until sentence dictation and finally the copying of paragraphs become the goal of daily practice. Each child learns to monitor his own spelling through precise multisensory procedures of listening, proofreading, and remembered hand movements.

Sequential steps to spelling, first base words and later derivatives, can be developed to the point of reflex action. For each word to be spelled in isolation students are encouraged to give an exaggerated "spelling pronunciation" and then to verbalize the procedures aloud. Spelling has always been the most difficult aspect of written language for students and in most cases this skill has lagged behind reading and handwriting. Non-phonetic words require special learning procedures and can, for the most part, be deferred until phonics are securely established and largely automatic.

Activity 8—Verbal Expression

Training in verbal expression has proved to be valuable even for those who can already communicate reasonably well. By and large children have

been entering our program with oral language intact, but some tend to ramble indefinitely without organizing their ideas or ever getting to their point. Others are unable to put into words their elaborate, creative mental pictures. All have needed training in the art of transmitting their thoughts clearly to others. In the ten-minute daily verbal expression time, each student is encouraged to express himself, orally at first and later on paper. Training in becoming aware of his own feelings and of their similarity to those of others; in recognizing his uniqueness, and in appreciating his special talents and abilities precede exercises which require him to interact verbally with others.

Advanced training culminates in written composition, both formal and creative. The level achieved by each student in the group depends on his age, grade, intelligence, interest, and degree of language learning difficulty.

Activity 9—Review of New Learning

A quick review of the day's new discovery or discoveries allows the students to leave each session with an awareness that they have extended or enhanced their store of knowledge or skills. Every concept is symbolized on cards after its introduction, for visual stimulation and for reinforcement of regular verbal rehearsal and discussion. Lasting only two minutes, this review activity is an efficient method of renewing previously-taught concepts and of helping the students to inter-relate all segments of their accumulating knowledge meaningfully, and to go out with a succinct formulation on which to focus as they learn to remember.

Activity 10—Listening

Through listening to the therapist's reading of classic tales, myths, legends, poetry, or current events, the students become familiar with characters and situations which they will meet again and need to remember in upper high school and later life. The selections are chosen for high interest value, preferably on the grade and intelligence levels of the particular students and far beyond their reading levels. Behavior is modified positively, too, through the offering of this five-minute daily "treat" which has to be omitted if time is wasted during the lesson in extraneous activity or conversation.

Skill in listening and in comprehension are deliberately promoted as major goals in this activity. Additional benefits are noted in the students' realization that books can be sources of information and entertainment—that reading is a skill which is well worth cultivating. Purposeful organization of

thought and time is a particularly valuable, necessary and rewarding aspect of the education of these students.

Constant daily use of structure, logic, categories, and organization seems to carry over into other aspects of the students' lives. It is possible that their ability to manipulate symbols in arithmetic, music, science, and other subject areas improves as training progresses.

Interim and Final Evaluations

The *Alphabetic Phonics* curriculum covers 85 percent of the English language and a student who completes the course is usually able to score adequately at grade level or above on standardized tests. Prior to the end of the twenty-four or more months of training required to cover the curriculum, any hitherto standardized measurement of progress has generally been found unsatisfactory and unrealistic. On the advice of the consultants in psychological testing the staff has developed measures which can be administered at intervals throughout training to determine periodically the amount of growth in learning since the last measurement. Called Bench Mark Measures, these tests require a score of 95 percent or better before the therapist can present new material effectively in the four activities of alphabet, reading, handwriting, or spelling on the next general level of difficulty or complexity. Thus the student is able to set his goal from the start, to write his own contract regarding the amount of material to be covered, and to judge for himself his degree of success in reaching that goal as measured on these benchmarks of mastery.

Standardized tests have been administered for re-evaluation of all students who have completed two or more years of training. The statistical analysis achievement as measured by the results of these tests is still pending. Positive subjective feedback has, however, been received from a questionnaire which was sent to former students. A score of 95 or better on the third and final level of the Bench Mark Measures has regularly correlated with most students' at least grade-level scores on standardized testing and with their ability to function independently at school.

Supplemental Activities

Emphasis on the students' aptitudes and talents was early recognized as central to any program of remediation. It was believed that every student can and should learn to read, write, and spell to some functional extent in order

to progress through school and to survive in current American culture, but also that each child should discover and develop at least one skill of some kind to a satisfactory level of proficiency, so that he will have at least one medium through which he can express himself comfortably and effectively.

A number of 30-minute supplementary programs have been provided as options for the students through the years, including sensory motor training, multisensory typing, and experimental arts. Of these, the arts program has been by far the most popular and universally successful, especially in those media which emphasize three dimensions, for this is an area of natural strength for many of our linguistically inept students.

Teacher Education

Remedial Language Training for the Language Therapist

All personnel who have trained the children or supervised in the Language Laboratory have completed a demanding two-year course under the direction of the staff and are certified by the Hospital as language therapists. This course, which includes an intensive practicum, has been offered to college graduates for whom credit could be arranged through one of several local universities. Most applicants have been trained as classroom teachers, but an undergraduate degree from the departments of English, Speech, Social Work, Guidance and Counseling, or Psychology has been accepted as a satisfactory alternate prerequisite. Because the children at entrance have already failed to respond to traditional classroom presentations, the staff believes that in-depth knowledge of the English language and of learning and behavioral theories is especially germane to therapist trainees' needs. The particular interests and personality traits of the applicants are also considered in their acceptance into the training program.

Restoring the children's confidence and reversing their poor self-image are the greatest challenges to the language therapists. Structured procedures and a sequential presentation of all material are found to be outstanding requirements for converting these defeated children into capable, confident, success-oriented, productive citizens. The step-by-step curriculum was developed to aid therapists in teaching the English language sequentially from introducing the alphabet to assuring grade-level proficiency in language skills. This curriculum has been published experimentally under the name of *Alphabetic Phonics*.

Didactic lectures, curricula, and materials developed for training of the therapists in the program's first decade were regularly revised and ultimately published as a result of the growing insights of the staff as the trainees demonstrated their techniques in teaching the children. The basic language curriculum made up of letters and concepts became both flexible and fundamental enough to be adapted to every age group and is now used throughout the Laboratory. Emphases and pace of presentation vary among the groups and can be individualized to meet the children's specific requirements.

Training for the Classroom Teacher

The classroom teachers' early recognition of these children and acquisition of techniques for correcting their milder confusions in reading, writing, and spelling were needed for the children and requested by both parents and teachers. Short-term courses, lasting six weeks, were accordingly developed and are offered each summer. A few schools have requested on-going supervision and long-term training by the Hospital staff for their own specialists. As a result, certain school districts in the area have been able to provide comparable screening, recognition, and remediation within the school setting. Approximately three hundred active classroom teachers have participated in the over-all program during the ten years of its history.

Teachers' Guidelines Summarized

Over-all guidelines for teaching language skills to a child with inadequate language learning talent have been implemented in the program and they can be recommended to others who are working with the same type of children.

1. Present all new material through the three major learning channels: visual, auditory, and kinesthetic. The student may prefer one pathway, although he needs all three for his understanding or integration of new learning. He leans on his strengths as he is learning to compensate for his weaknesses and to overcome them.

2. Structure each procedure, numbering the steps which the student must follow and requiring him to use them repeatedly in precisely the same order. He is scattered and needs organization. Picture each step and post a list for his visual reference. This helps the adults to avoid nagging.

3. Provide challenging activities which require repetition of all basic processes until automaticity is achieved. The student must deliberately

overlearn each concept in order to internalize and develop it into a reflex.

4. In planning, reduce any material to be taught to its smallest elements. Organize the elements sequentially. Each new segment must evolve logically from the one before. This type of student in particular learns best that which he discovers or works out for himself and which bears relationship to the familiar. He must initially, often with help, discover a concept and then synthesize it into his own meaningful store of information. From his point of view, inductive learning should generally precede deductive application of principles and their codification as useful rules.

5. Give all instructions or directions by telling him, showing him, and helping him to "walk through," "talk through," "draw through," or otherwise to rehearse them, in order to insure his full understanding. He cannot successfully follow directions or answer questions which are unclear to him.

6. Assume nothing and ask him to perform only those tasks for which he has good tools. Start at the beginning and take ongoing inventory, checking his knowledge in pertinent areas. He must develop both self-assurance and precision.

7. Measure his progress in all areas throughout training. Do not compound his confusion by moving too rapidly. Review insecure elements after each measurement (until he is 95 percent successful) before introducing new material.

8. Teach thoroughly the necessary arbitrary learning which cannot be "discovered" or "inducted," such as the alphabet sequence and the basic sound-symbol relationships. Provide regular, structured review, utilizing the student's auditory, visual, and kinesthetic channels whenever possible. Help him to transfer this skill into other contexts.

9. Prepare to be flexible and creative in approaching each student and in persisting until every student is able to grasp and then to use the material. The curriculum, with its logical organization of the English language, is the only immutable variable in remedial language training. Every child is different and brings his own set of family, peers, and school influences. Flexible adaptation in details of presentation and achievement of mastery can meet individual needs with underlying emphasis on a curriculum approach rather than a rigidly stereotyped method.

10. Plan each day's lesson to insure for the student both his near-perfect success and his awareness that he has expanded his knowledge by another step, even if it is a small one. He must know both where he has

been and where he is going before he is able, and therefore willing, to cooperate in a long-range plan, especially if it involves his weakest and so, perhaps, his least favorite activities.

The staff has continuously and systematically explored various materials and techniques. In every case the route chosen is the one which has succeeded most often with the greatest number of children. Each elected direction must meet the criteria delineated by the pertinent department at the Hospital. Not *the* way, but *a* way has thus been pioneered with some degree of success.

Overview of Language Training

A large percentage of children, in the view of the staff, develops school-based, or secondary, language skills normally in the regular classroom. The approach or method of teaching seems not to be critical for most of them. At the pre-school level some children are already high educational risks, i.e., they exhibit poor aptitude in spatial orientation and directionality; weakness in the auditory, visual, or kinesthetic functioning; delay in the development of oral language; and/or a lag in the formation of conceptual skills. Any combination of these several deficits can interfere with the normal maturation and coordination of the areas which are essential for successful language learning. These children deserve training which strengthens them in the areas of their weaknesses and evens out their preparation in order to minimize likelihood of language learning difficulty in the first grade. A program to detect and train these young children was initiated at the Hospital at the outset and is being expanded. Based predominantly on the Montessori materials, training is individualized to strengthen each child's particular weaknesses and to emphasize primary language and basic conceptual skills.

When some children reach the first grade, they are still lagging in the development of skills required to learn to cope with written language. These children may be helped to swing into adequate functioning with only a minimum of corrective training at the classroom level. The short-term training course for the classroom teacher was designed to meet this need.

There is a small percentage of children, in the staff's opinion, whose over-all language learning talent is so low on the continuum that they require complete and prolonged language retraining. Among these are the children who have participated in the Scottish Rite programs described here.

Empirical questions concerning the most advantageous teaching proce-

dures and curricula arose daily during the program's growth and many were resolved through trial in the Laboratory. Any process which was consistently both popular and successful among 100 children of different ages for a prolonged period was built into the daily lesson plans. Choice and alignment of segments of the curriculum were determined on the basis of experience by at least ten trained language therapists who were in practice and consultation in the Laboratory at all times. Questions regarding order of presentation of the alphabet letters, inclusion of concepts, or the order of steps in a particular process were answered by the children's responses. Language therapists and teachers-in-training were able to expand the base of the curriculum's exposure through their private work and regular demonstration lessons at the Center with individuals whose ages ranged from six to thirty-six.

Finding answers to the all-important scientific questions regarding the long-term success of the program was slow and difficult. In anticipation of computerizing the major questions, a twenty-six page coding form was developed and a broad spectrum of information was collected on every student from the start. Data is being amassed sufficient to provide for a vast number of studies. Although the major results are still not fully established at this time, a number of short-term studies were completed along the way which have added impetus to the project.

Two possible modifications, in particular, await the computer's conclusions. One modification could affect the battery of tests used in the initial evaluation. The second modification could stem from the measurement of the students' success in the program and this could alter the curriculum or teaching procedures.

A longitudinal follow-up study must be instituted and completed before the initial hypotheses can be *fully* accepted. Pending the completion of controlled research, the high percentage of satisfied and successful children, families, and cooperating schools has encouraged the staff to persist in their chosen direction.

Acknowlegments

The curriculum and compilation of structured techniques for multisensory teaching of the secondary language skills evolved predominantly from the study and combined efforts of the staff in the Language Unit in the Neurology Division of the Scottish Rite Hospital. Approximately six hundred language therapists, clinicians, and teachers in public, private and parochial

schools who were trained at the Hospital have generously contributed their experience, insights, and suggestions which have emerged from teaching hundreds of Texas children. Teacher trainees from fifteen other states and six foreign countries have broadened the perspective of the programs. The curriculum has been translated into Spanish and used in at least two Latin American countries.

Both the multisensory introduction of graphemes and the schedules of daily lesson plans were substantially based on the Gillingham-Stillman *Remedial Training for Children With Specific Disability in Reading, Spelling, and Penmanship*, the "red manual" published in 1956.

Spelling concepts predominantly evolved from insights developed by Sally and Ralph Childs and published in 1963 in their book *Sound Spelling*. Prevailing linguistic principles as set forth in the Department of Health, Education and Welfare publication, *Phoneme-Grapheme Correspondences as Cues to Spelling Improvement* directed by Paul Hanna and published in 1966, were integrated into the reading and spelling activities in the global language training.

Certain viable aspects from the following sources were adapted and incorporated into the program (see Bibliography): Critchley, Montessori, Piaget, Skinner, Glasser, Rogers, Slingerland, Fernald, Merrill, Zaner-Bloser, Science Research Associates, McGuffey, Open Court, Johnson Handwriting Program, Rand McNally, Daniels and Diack, Barnhart, and The International Society for General Semantics. Effective compatible theories from neurology, psychiatry, psychology, linguistics, and education dictated the choice of each direction.

Special appreciation must be expressed to Dr. Lucius Waites, director, and to the Scottish Rite Masons of Texas who financed and supported the Language Unit, the Library, and the Language Research and Training Laboratory, without which the programs could not have been developed.

Selected Bibliography

Barnett, L. 1964. *The Treasure of our Tongue.* New York: Alfred A. Knopf.

Barnhart, C. and L. Bloomfield. 1963. *Let's Read.* Books 1–9. Detroit, Michigan: Wayne State University Press.

Bessell, H. and U. Palomares. 1970. *Methods in Human Development—Theory Manual.* El Cajon, California.

Bowen, C. C. 1972. *Angling for Words: A Workbook for Language Training.* San Rafael, California: Academic Therapy Publications.

Bowen, C. C. 1972. *Angling for Words: A Study Book for Language Training.* San Rafael, California: Academic Therapy Publications.

Broadley, M. 1972. *Be Yourself–Analyzing Your Innate Aptitudes.* Washington-New York: Robert B. Luce.

Bruner, J. 1961. *The Process of Education.* Cambridge, Massachusetts: Harvard University Press.

Bryant, N. D. 1965. Some principles of remedial instruction for dyslexia. *The Reading Teacher,* April, 1965.

Bywaters, D. M. 1973. *Affix and Root Cards.* Cambridge, Massachusetts: Educators Publishing Service.

Chalfant, J. C., and M. A. Scheffelein. 1969. *Central Processing Dysfunction in Children.* Review of Research, N.I.N.D.S. Monograph No. 9. Washington, D.C.: U. S. Department of Health, Education and Welfare.

Chall, J. 1967. *Learning to Read: The Great Debate.* New York: McGraw-Hill.

Chase, S. 1938. *The Tyranny of Words.* New York: Harcourt, Brace and World.

Childs, S. B. (ed.). 1968. *Education and Specific Language Disability: The Papers of Anna Gillingham, M.A., 1919–1963.* Towson, Maryland: The Orton Society, Monograph No. 3.

Childs, S. B. 1965. *Magic Squares.* Cambridge, Massachusetts: Educators Publishing Service.

Childs, S. B. and Ralph deS. Childs. 1963. *Sound Spelling.* Cambridge, Massachusetts: Educators Publishing Service.

Clarke, L. 1973. *Can't Read, Can't Write, Can't Talk Too Good Either: How to Recognize and Overcome Dyslexia in your Child.* New York: Walker and Company.

Cole, E. M. and L. Walker. Reading and Speech problems as expressions of a specific language disability. *Disorders of Communication,* Vol. XLII, Research Publications of the Association for Research in Nervous and Mental Disease, 1964. Also, Orton Society reprint.

Coombs. M. S. 1967. *Ginn Vocabulary Program.* Charterbooks A–G, Boston, Massachusetts: Ginn and Company

Cox, A. R. *Situation Spelling.* 1971a. Cambridge, Massachusetts: Educators Publishing Service.

Cox, A. R. 1971b. *Instant Spelling Deck.* Cambridge, Massachusetts: Educators Publishing Service.

Cox, A. R. 1972a. *Situation Reading.* Cambridge, Massachusetts: Educators Publishing Service.

Cox, A. R. 1972b. *Initial Reading Deck.* Cambridge, Massachusetts: Educators Publishing Service.

Cox, A. R. 1974. Revised. *Structures and Techniques–Remedial Language Training.* Cambridge, Massachusetts: Educators Publishing Service.

Critchley, M. 1970. *The Dyslexic Child.* Springfield, Illinois: Charles C Thomas.

Davis, M. and M. I. Brownlee. 1970. *Typing Keys for Remediation of Reading and Spelling.* San Rafael, California: Academic Therapy Publications.

de Hirsch, K., J. Jansky, and W. M. Langford. 1966. *Predicting Reading Failure.* New York: Harper and Row.

Dugan, W. 1972. *How Our Alphabet Grew.* New York: Western Publishing Company. A Golden Book.

Ervin, J. 1973. *Reading Comprehension in Varied Subject Matter.* Cambridge, Massachusetts: Educators Publishing Service.

Fernald, G. 1943. *Remedial Techniques in Basic School Subjects.* New York: McGraw-Hill.

Fries, C. C. 1966. *Linguistics and Reading.* New York: Holt, Rinehart and Winston.

Frierson, E. C. and W. B., Barbe, (eds.). 1967. *Educating Children with Learning Disabilities.* New York: Appleton-Century-Crofts.

Funk, W. 1950. *Word Origins and Their Romantic Stories.* New York: Grosset and Dunlap.

Gesell, A. and F. Ilg. 1946. *The Child From Five to Ten.* New York: Harper and Row.

Gillingham, A. and B. Stillman. 1956. *Remedial Training for Children with Specific Disability in Reading, Spelling, and Penmanship.* (Red Manual). Cambridge, Massachusetts: Educators Publishing Service.

Ginott, H. G. 1965. *Between Parent and Child.* New York: The Macmillan Company.

Ginott, H. G. 1969. *Between Parent and Teenager.* New York: The Macmillan Company.

Ginott, H. G. 1972. *Teacher and Child.* New York: The Macmillan Company.

Glasser, W. 1969. *Schools Without Failure.* New York: Harper & Row.

Goldberg, H. K. and G. B. Schiffman. 1972. *Dyslexia—Problems of Reading Disabilites.* New York: Grune and Stratton.

Green, G. F. 1967. *Alphabetic Phonics Alphabet Cards.* Cambridge, Massachusetts: Educators Publishing Service.

Green, G. F. et al. *Alphabetic Phonics Workbook 1; The Teacher's Manual for Workbook 1; Alphabetic Phonics Workbook 2; Alphabetic Phonics 3; Teacher's Manual for Alphabetic Phonics 3.* Cambridge, Mass.: Educators Publishing Service.

Hall, R. A. 1961. *Sound and Spelling in English.* Philadelphia, Pennsylvania: Chilton Books.

Hanna, P., et al. 1966. *Phoneme-Grapheme Correspondences as Cues to Spelling Improvement.* Washington, D. C.: Department of Health, Education & Welfare, U.S. Government Printing Office.

Hayakawa, S. I. et al. 1964. *Language in Thought and Action,* Second Edition. New York: Harcourt Brace.

Hayakawa, S. I. 1968. *Use the Right Word—A Modern Guide to Synonyms.* Pleasantville, New York: Reader's Digest Association.

Hermann, K. 1959. *Reading Disability.* Springfield, Illinois: Charles C Thomas.

Hodkinson, K. and J. G. Ornato. 1967. *Wordly Wise,* Books 1–9. Cambridge, Massachusetts: Educators Publishing Service.

Holt, J. 1964. *How Children Fail.* New York: Pitman Publishing Corp.

Holt, J. 1967. *How Children Learn.* New York: Pitman Publishing Corp.

Johnson, D. and H. R. Myklebust. 1967. *Learning Disabilities.* New York: Grune and Stratton.

Johnson, W. 1972. *The Johnson Handwriting Program.* Cambridge, Massachusetts: Educators Publishing Service.

Jordan, D. R. 1972. *Dyslexia in the Classroom.* Columbus, Ohio: Charles E. Merrill Publishing Company.

Kavanagh, J. F. and I. G. Mattingly, (eds.). 1972. *Language by Ear and By Eye: The Relationships Between Speech and Reading.* Cambridge, Massachusetts: The M.I.T. Press.

Kirk, S. A. 1972. *Educating Exceptional Children.* Boston, Mass.: Houghton Mifflin Company.

Lerner, J. W. 1971. *Children with Learning Disabilities.* Boston, Massachusetts: Houghton Mifflin Company.

Merriam, G. & C. Company. 1963. *Webster's Elementary Dictionary—A Dictionary for Boys and Girls* (with diacritical markings used in the second International Printing). Cincinnati, Ohio: The American Book Co.

Money, J., editor. 1962. *Reading Disability—Progress and Research Needs in Dyslexia.* Baltimore, Maryland: Johns Hopkins Press.

Montessori, M. 1964. *The Montessori Method.* New York: Schocken Books.

Murray, M. E. 1973. A Study of Personality, Prolonged Reading Failure, and Early Success in Initial Remedial Language Training in Children with Specific Reading Disabilities. Unpublished dissertation, University of Texas Health Science Center in Dallas.

O'Connor, J. 1948. *English Vocabulary Builder*, Volumes 1–3. Boston, Massachusetts: Thomas Todd Company

Orton, J. L. (ed.) 1966. *"Word Blindness" in School Children and Other Papers on Strephosymbolia (Specific Language Disability–Dyslexia), 1925–1946 by Samuel T. Orton, M.D. (Monograph No. 2)*. Towson, Maryland: The Orton Society.

Orton, S. T. 1937. *Reading, Writing, and Speech Problems in Children*. New York: W. W. Norton.

Pattison, W. D. 1965. *Going Places: "How Far?" "Which Way?" "Where?"* Chicago, Illinois: Rand McNally.

Piaget, J. 1964. *The Early Growth of Logic in the Child*. New York: W. W. Norton.

Rawson, M. 1968. *Developmental Language Disability: Adult-Accomplishments of Dyslexic Boys*. Baltimore, Maryland: The Johns Hopkins Press.

Rogers, C. R. 1965. *Client-Centered Therapy*. New York: Houghton Mifflin Company.

Rotzel, G. 1971. *The School in Rose Valley*. Baltimore, Maryland: The Johns Hopkins Press.

Schain, R. J. 1972. *Neurology of Childhood Learning Disorders*. Baltimore, Maryland: Williams and Wilkins Company.

Schiffman, G., and R. L. Clemmens. 1966. Observations on Children with Severe Reading Problems, *Learning Disorders*, Volume 2. Seattle, Washington: Special Child Publications.

Slingerland, B. H. 1967. *Training in Some Prerequisites for Beginning Reading*. Cambridge, Massachusetts: Educators Publishing Service.

Symmes, J. 1972. Deficit models, spatial visualization and reading disability, *Bulletin of Orton Society*, XXII.

Thompson, L. J. 1966. *Reading Disability: Developmental Dyslexia*. Springfield, Illinois: Charles C Thomas.

Waites, L. and A. R. Cox. 1969. *Developmental Language Disability . . . Basic Training . . . Remedial Language Training*. Cambridge, Massachusetts: Educators Publishing Service.

Walcutt, C. C. 1961. *Tomorrow's Illiterates*. Boston, Massachusetts: Little, Brown and Company.

Wees, W. R. 1971. *Nobody Can Teach Anyone Anything*. Garden City, New York: Doubleday and Company.

Wolf, C. W. 1968. A Statistical Study of Specific Dyslexia . . . Characteristics and Syndrome Patterns. Unpublished Doctoral Dissertation, University of Houston.

Wordcrafters Guild. 1956. *The Guideword Dictionary*. Washington, D.C.: St. Alban's School.

Zaner-Bloser Company. 1963. The Writing Frame. Columbus, Ohio: Zaner-Bloser Company.

Cluttering and Stuttering

Katrina de Hirsch, F.C.S.T.

Let me begin by describing briefly two children: a boy and a girl, both in their fourth year of life, and both referred to us within the same week because of what the referring physicians called "severe stuttering."

First, Steven. Steven's family history was heavily positive in terms of disorders of spoken, written and printed language. His father had stuttered as a child; his mother, a highly intelligent individual who had done well in mathematics and science at school, had trouble with writing essays all through her college years and is now a slow reader. Her brother, an architect, is a "bizarre" speller and his handwriting is atrocious.

Pregnancy with Steven had been uneventful, delivery at term and uncomplicated. Steven was a cheerful, robust infant who passed developmental milestones at the expected times except for speech, which had been slow to emerge. When the boy finally began to communicate verbally, even his mother had difficulty making out what he was trying to say. At age three, his articulatory patterning presented significant difficulties. Steve's sentences were rudimentary and he hunted for words. The boy had a lively mind and a rich imagination. He was interested in magic and in the stars and he wanted to know whether his dog would go to heaven and what kind of heaven it was going to be. One can easily imagine how frustrating the discrepancy between this child's complex ideas and his impoverished verbal tools must have been. No wonder he had temper tantrums. It was surprising and a testimony to his basic friendliness that in spite of his poor speech he got along well with his peers.

Ten months before we saw him, the parents had been on the point of having his speech investigated but dropped the idea because of Steven's sudden improvement. His sentences became much longer, his vocabulary increased, articulation cleaned up somewhat. He continued to have a great deal of trouble formulating ideas, however, and a tendency to iterations of sounds, words and phrases persisted.

This paper was presented at the World Congress on Dyslexia, Rochester, Minnesota, November 1974.

During the summer before we saw him things had taken a turn for the worse. The family had spent July and August at the grandparents' place. His beguiling two year old sister enslaved not only the father but the rest of the family, as well as the servants. This exceptionally verbal child talked rings around her brother. The mother was in the first months of another pregnancy. (She said she hadn't told the children though I believe Steve suspected something was up.) At any rate, the boy started having nightmares and his speech deteriorated rapidly. His earlier effortless iterations became more frequent and much more tense. The mother reported that Steven had started tapping his foot when he had trouble getting words out. She realized something was wrong.

We saw Steven a few days later. I remember him vividly; a dark-haired fellow with sparkling brown eyes and considerable poise. He separated easily from his mother, and although she had warned me that he would be hard to test—Steve was, in fact, moderately hyperactive—he was a trusting, friendly little boy. He made some enthusiastic but totally ineffective attempts at using a bat. Finer manual control and visuo-motor organization also were poor. Steve had a terrible time fitting wooden nails into fairly large holes. He was nowhere when it came to graphic activities, and he held the pencil as if it were an icepick. He could copy a circle but not a cross and he adamantly refused to attempt a human figure drawing. I knew his father was a painter and it did occur to me that there might be a connection: father-penis-pencil. Probably there was, but at best Steve was somewhat dyspraxic anyway. His auditory discrimination was inferior, his auditory memory span was quite short, and not only for speech sounds; he had a hard time repeating a simple pattern tapped out for him. Not only was his rhythmic ability below par but he evidently had trouble grasping and reproducing auditory Gestalten. He was, incidentally, tone-deaf. His Bender copies showed that the Gestalt was weak also in the visuo-motor area.

Language processing was not impressive. By and large, Steve understood the speech of others but he tended to miss the interpretation of more complex linguistic structures. His word-finding difficulties were gigantic. He could describe the functions of a shovel, for instance, and he could match colors without the slightest difficulty, but he could not retrieve their verbal referents. He was unable to name pictures of objects such as badge and chimney. Sequences presented a hurdle; he transposed syllables in words and words in phrases. His formulation difficulties were striking. When trying to express more complex ideas he got himself into a complete jam. He would

look quite desperate during such moments, and things went from bad to worse when either the organizational or the emotional load became too heavy. On such occasions he became blocked and to one's distress the breathing apparatus became involved; also one noted eye blinking. Occasionally he gave up altogether, simply shrugging his shoulders, and looked profoundly discouraged.

The stories Steve told in response to pictures shown him were of interest. They revealed a boy who continued to long for early instinctual gratifications of which he himself heartily disapproved. There were some oral and quite a few anal concerns and indications of the age-appropriate competition with father for mother. His rage about his sister was pretty much in the open. At this point he would gladly have strangled her, which in turn aroused considerable guilt. Looking at the protocol as a whole, though, one saw a fundamentally solid boy who showed along with infantile needs a strong push towards mastery and more mature ways of functioning: one saw a boy, in other words, whose defenses were basically intact. Why then had Steve's speech gone to pieces?

Before pursuing this question, let us turn to Bee, a three-and-a-half-year old girl, an only child who had been referred by the pediatrician with the same complaint: severe stuttering.

An interview with the mother showed no evidence of a positive family history of language disorders. Because of the nature of the father's job, the family had moved several times before the child was three years old. She had been cared for by a pleasant housekeeper who accompanied Bee and her parents during their many moves. Bee's development had been, if anything, accelerated except for toilet training which had involved considerable struggles. She had started to "converse" as the mother called it before the age of two. She had practiced words and sentences in bed before using them in a social context. Even at that early age Bee must have been desperately perfectionistic. Her mother said that the child now produced long and complex sentences and that her vocabulary was unusually rich and sophisticated for her age.

Following the departure of her beloved nurse, Bee was looked after by a series of more or less unsatisfactory substitutes. Around the same time she began having trouble falling asleep, insisting a dozen times during the evening that she had to go to the bathroom and carrying on to such a degree that the mother became exasperated and administered a few spankings. Hesitations in Bee's speech were first noted around that time. Bee had always had an

imaginary companion but "Mr. Tall," as she called him, was now very much more in evidence.

Roughly five weeks before we saw the child, another nurse who had since been dismissed, took over. She changed all of the little girl's routines; she discovered occasional masturbatory activities and in order to "cure" Bee she slapped her hands and used words such as "dirty." Stuttering increased dramatically and the child suddenly became so afraid of speech that she covered her mouth when talking and finally resorted to whispering.

Bee's mother impressed me as being upset and guilty. She appeared to be highly intelligent and quite perfectionistic. Above all, she seemed totally unaware of the fact that her demands on Bee for grown-up behavior were quite heavy. Being probably afraid of her own needs for more primitive gratifications, she was clearly unable to tolerate them in her child.

When we first met Bee we found a dainty, blond, serious girl, introduced by her mother as "Miss Bee." It was evident from the start that the child was extremely cautious, tense and very, very bright. She had brought in Mr. Tall—a yellow China cat—but she was quite doubtful about separating from her mother. After some vacillation she settled for having the door to the waiting room left open. Choosing between toys and making decisions were not easy for this youngster. She finally sat herself in front of the doll house and proceeded to put Mr. Tall to sleep. This served as an excellent pretext for whispering. "We mustn't wake up Mr. Tall," she said. The child appeared to be quite ritualistic and spent her time putting the dolls in and out of bed. When, after much coaxing she came to the bathroom to play with water, she filled several containers and emptied them over and over again. Bee was distressingly clean and felt quite uncomfortable when one gave her a baby bottle to suck. Altogether her behavior lacked spontaneity and there was not much fun to her play.

Bee's auditory memory span was long, her auditory discrimination unusually good. I remember how impressed I was with the quality of her Bender copies at so early an age. But I also remember that the designs were crowded into the left border of the page and that she counted dots compulsively.

Bee stuttered severely; the pattern was of the kind described by Froeschels (1943) as belonging to an advanced stage of the disorder. There were frequent prolongations of sounds, severe tonic manifestations, blocks of long duration, muscular tension, and avoidance rituals. One vividly sensed the phobic quality of the child's speech and one could not but feel for this tense and constricted little girl who appeared to be locked into a struggle with language.

These two children referred for what were claimed to be identical symptoms could not have been more different. In contrast to Bee, Steve's central nervous system organization appeared to be immature. While Bee's ability to handle complex linguistic constructions was excellent, Steve's was woefully inadequte, a fact which forecast subsequent difficulties with written and printed language (to which I shall refer later). These children's ways of coping with the stresses and strains of growing up differed, as did the emotional climates of their homes. Finally, at closer inspection, the speech symptom itself differed. One could thus assume that the underlying dynamics differed and that, as a consequence, very different types of therapeutic interventions were called for.

Before discussing therapy, allow me to outline some theoretical considerations which may provide a tentative answer to some of the questions raised in the past concerning what the American literature calls "non-fluency" (1959, 1961). These questions are:

1) Should all disruptions of the rhythmic flow of speech be viewed as "stuttering"?

2) Are some of these disruptions related to difficulties with printed and written language?

3) Can one judge from the history and the symptom itself whether one is confronted with a specific language disorder or with a psychoneurosis?

4) If these disfluencies reflect different types of disturbances should therapy differ accordingly?

Language learning in childhood passes through a series of interrelated stages. According to Werner (1966), development entails the emergence of new forms of organization, novel structures and modes of operations eventuating in increased subordination of parts to wholes and in both greater stability and flexibility of functioning. Language development is a striking example: The young child meets the first hurdle during transition from non-symbolic to symbolic utterances—from babbling to single words and two word phrases. Between two and three years of age he meets the second big hurdle: the transition from two word phrases to hierarchically structured utterances. He no longer deals with strings of words but with syntactical organizations, a formidable task and one fraught with hazards. The incorporation of basic linguistic rules, the learning of innumerable transformations, the acquisition of novel meanings all place an enormous burden on the child whose neurophysiological organization is as yet immature. The change from "baby cry, eat" to "the baby cries because he would like to eat" represents a gigantic conceptual and syntactical step. As the youngster grapples with new

and complex linguistic structures, one notes an increasing number of iterations of sounds and words. Among linguistically normal children between the ages of two and four, one of every four words is repeated in one form or another. These repetitions consist of effortless iterations of sounds and words, executed at normal speed and should not be labelled "stuttering," not even "primary" stuttering. They are quite different in kind from the anxiety laden, phobic, compulsive repetitions of true stuttering.

It is essential to remember that the elaboration of complex syntactical organizations occurs at a crucial time in the child's life, when he has to renounce early infantile gratifications: the age when, as often as not, a battle is raging around toilet training and the child passes through what analysts call the anal phase of psycho-sexual development, the age also when, in many instances, a new baby threatens the youngster's place in the center of the family stage. The child is thus faced with a double crisis: linguistic and emotional. I refer to Wyatt's work (1958) for this important point. Given a severe degree of tension and conflict, the still vulnerable language function breaks down, iterations increase by leaps and bounds, and in certain children the loose, effortless repetitions change. Pressure is being introduced, sounds are lengthened, b-b-b-ball changes into b—all, anxiety mounts, and internal and external conflicts are fought out on the level of language.

Most children pass through the normal phase of syllable and word iteration without harm. With increasing neurophysiological maturation and improved ability to handle complex linguistic structures, language organization no longer breaks down under stress. A year later, when speech is safely established, conflict and tension will no longer be expressed by a speech symptom. Given that all children go through the normal sound and word repetitions, and that all of them have to struggle with increasingly complex linguistic structures, and that, moreover, the process of growing up is stressful for all youngsters, one must ask why some children become stutterers while the large majority does not.

It appears that two variables are involved: first, children vary enormously in their ability to withstand strain. We believe—as does Weil (1970)—that genetic factors determine in part the degree of vulnerability of a given organism and that there are innate differences in capacity to cope with trauma and to marshal workable defenses. It goes without saying, furthermore, that the degree of stress varies in a given family. There are mothers who instinctively lower their demands when the child is under pressure and who raise demands when the youngster is ready to move forward.

Wyatt (1969) feels that separation from the mother, resulting in what she calls "distance anxiety," is the main contributor to stuttering during a time when the child's language organization still is unstable. While the mother is, of course, the central figure in the child's universe, I believe that any severe conflict—and anal ones are very much in the foreground during this particular phase—can trigger stuttering. Analysts refer to anal-sadistic aspects of stuttering and certain features in the symptom itself make such an assumption plausible. I personally am impressed by the many references to biting in the projective material of stutterers, which would point to still earlier oral conflicts. These speculations belong, of course, to metapsychology. In children like Bee, at any rate—and her stuttering closely resembles, in terms of history and symptomology, that found in older children who start stuttering out of a blue sky, as it were—the symptom does *not* rest on the basis of an unstable language organization. In Bee's case conflicts related to precocious ego development resulted in stuttering which reflected the beginning of an obsessive system. So much for the first variable. Let us look at the second one.

Some children's linguistic organization is less robust, less resistant to assault than that of others. Orton (1937) pointed this out in the thirties. Such children tend to be late in learning to talk. Their phonemic patterning remains infantile until the age of six and sometimes later. Masland and Case (1965) referred to such youngsters' tendency to simplify phonemic detail. Syntactical development is deviating. In spite of often better than adequate intelligence, vocabulary is limited. Word-finding difficulties are severe. The child appears to lack anticipatory schemata of what the sentence is going to say. Grewel (1970) spoke of these children's failure "to cast a syntactical shadow." There are many false starts, pauses, and fillers, and one notes both omissions and additions of linguistic units. Melodic, dynamic, and rhythmic aspects of language are disturbed. Speech is frequently monotonous, reflecting difficulties with organization. Orton (1937) discussed the children's trouble with sequencing and word order. They not only transpose sounds in words but also words in sentences. "God is my loving shepherd," might come out as "God is my shoving leopard."

The speech of such children—and Steven was one—is marked by acceleration of output, inferior sentence organization, dysnomia and often massive increase in the normal iterations of sounds, syllables or words in the absence of tension and anxiety. I am, of course, discussing "cluttering," a symptom first identified by Lieberman (1900) and fully described by Weiss (1935) and

by Freund (1934) in the mid-thirties. I refer to Weiss' (1950,1964) elaborations of the differential diagnosis between cluttering and stuttering and to my own publications (1950,1969) in which I draw attention to the writing and spelling disorders of cluttering children. Arnold's (1965) and Liechsinger's (1963) research also are pertinent.

You all know clutterers although you may not have labelled them as such. They are often voluble and rapid-fire talkers. Their sentences appear to be hanging in mid-air. There is little structure to their verbal output; they tend to ramble on. One observes an unusual number of fillers such as "em," "you know," etc. as well as omissions of words or even parts of sentences.

An investigation of some of the processes underlying language performance reveals dysfunctions of the kind we have observed in Steve: diffuse auditory discrimination and defects in auditory memory. We find, in other words, difficulties in holding on to the Gestalten on several levels of integration: perceptuo-motor and linguistic. Clutterers lose the verbal Gestalt—spoken, written or printed—from one moment to the next. In 30 years of experience I have never seen a clutterer who was a good speller. Bender's (1966) concept of primitive plasticity is highly pertinent in this context. The instability of the children's temporal and spatial experiences—and according to Lashley (1954) the two dimensions are practically interchangeable—shows up in their speech, which is a sequence in time, and in their spelling and writing, sequences in space. Like younger children, clutterers simplify phonemic clusters and telescope words both in speech and in spelling. They run their words together in writing exactly the way they do in speaking. Their difficulties with organization extend to content which is loose and disjointed to a point where occasionally whole parts of sentences are omitted. The papers these individuals hand in *look* exactly the way they *sound*. Roman (1962), an expert in graphology, had no trouble at all picking out the written productions of clutterers from a large number of papers she was given for analysis.

Cluttering belongs in the category described by Orton (1937) as "developmental language disorders." I would say it is the prototype of this category because the symptom embraces spoken, printed and written aspects of language. We usually find a positive family history in cluttering, as outlined by Orton (1930).

But is it actually the language disorder per se that is genetically determined? The evolution of Gestalten, according to Bender (1958), is a maturational process and refers to the individual's inherent integrative response to a

configuration. In developmental language disorders such as cluttering we find immature and undifferentiated patterning—remember Steve's primitive Bender copies, his diffuse auditory perception, his infantile articulation. We find the kind of instability and primitivity which, according to Bender (1966), constitutes a maturational lag. It is of considerable interest that the EEGs of older clutterers show theta waves (4 to 7 cycles per second) that are typical for early childhood and should disappear around the age of six. Zangwill (1962) claims that immaturity may be genetically determined and one might thus conclude that what is handed down in given families is not so much a tendency to language disturbance as an underlying pervasive organismic immaturity, which is reflected in deficits in higher cortical functions such as language.

This hypothesis would account for the fact that language disorders are found so much more frequently in boys than in girls, given the acknowledged slower maturational rhythm of boys as compared to girls.

None of the above holds true for what I will for contrast's sake call "pure" stuttering. There are no indications of a maturational lag. Family history is mostly negative. Bee's protocol was singularly devoid of perceptuomotor dysfunctions; her linguistic development was advanced. In contrast to Steve, who has remained a bizarre speller and who originally had trouble catching on to reading, Bee became an excellent reader and her spelling cannot be faulted. Bee's speech difficulties were not physiologically determined.

Pure stuttering—that is to say, stuttering that is not an elaboration of cluttering—is often found in older children whose early linguistic development was entirely normal and whose use of verbal tools is basically excellent. Onset is relatively sudden and in all cases accompanied by anxiety and tension. Severe stuttering of this type may in some instances mask psychopathology. More frequently it is related to a variety of psychoneurotic mechanisms. As the child grows older and sometimes already in pre-latency, stuttering becomes part of the individual's defensive system and as such is not accesible to modification by speech therapy.

It would be a simplification to identify only the extremes of the continuum—cluttering at one end and pure stuttering at the other. In one child the normal strains of growing up will, at certain critical ages, suffice to produce some transient stuttering symptoms. The same strains may not have this effect on another child. On the other hand, severe conflict may overload a fundamentally fairly stable linguistic organization.

Let us now go back to our two youngsters and discuss what these theoretical considerations imply in terms of diagnosis and therapy. Steve was, and still is, a clutterer. At the age of four and five the conflict between his genuine love for his father and his angry feeling about him which centered around possession of the mother was complicated by the severe frustrations resulting from his deficient verbal tools. One could see him trying to find words but the more he tried the more entangled he became, and as a result the earlier repetitions of sounds and words turned into something less benign, temporary stuttering.

We took Steve on for therapy and Dr. Jansky worked with him for 14 months. At first he simply played with a sword and a ball; the choice of activities was his. He was not encouraged to talk. A little later I remember him sitting in a house he had built himself out of cardboard. I think it was the nearest thing to a womb he could get and in this situation he was not asked to share it with his sister either! Later Dr. Jansky fed him candy from a spoon through an opening in the wall. No psychological interpretation of any kind was attempted but the child was rather encouraged to regress at this particular juncture. Very slowly there developed a give and take in terms of words and phrases, all on a pretty infantile level, which gave him a chance to reintegrate his speech on a far simpler plane. The therapist echoed Steve's own verbalizations, in the process slowing down the rate and shortening the number of units in a sentence. In other words she helped the youngster with his organizational difficulties by both simplifying and structuring his verbal output for him. It all seemed to be enormously reassuring to the child, especially since his mother was encouraged to baby Steve for a while, to read him nursery rhymes, to sing to him, to stress rhythmic activities and to increase oral gratification when was under stress. In about 15 weeks time the speech blocks had practically disappeared.

From then on Dr. Jansky slowly started working on Steve's poor verbal tools, helping him with his word-finding difficulties, etc. Attempts to assist him with formulation of his thoughts were postponed until Steve felt entirely happy about his speech. After a few months this became the core of the program. After another six months Steve's verbal tools were by no means impressive, but he was better able to express his feelings and there was no sign of stuttering. However, grapho-motor difficulties continued to plague him and his speech was far from well organized; it was dysrhythmic and overly fast. He continued having severe difficulties with word-finding. We therefore advised his parents to postpone first-grade entrance for a year—without

success. Steve now lives in a suburb, he did master reading after repeating first grade and receiving a good deal of remedial help. As reported previously, his spelling is deplorable and his compositions are quite poor, but he does very well in math and science: he is a well-adjusted youngster and happy with his friends. There has been no recurrence of stuttering.

We referred Bee to a child analyst. She worked intensively with both mother and child, and in the space of about 17 months stuttering had entirely disappeared; when we saw Bee years later for a check-up she impressed us as a much freer youngster. She was no longer so desperately clean and she was better able to reach her productive potential. She is an A student.

To sum up and to attempt some kind of answer to the questions raised earlier:

1) Not all disruptions in the rhythmic flow of speech can be viewed as stuttering. Stuttering has to be differentiated from cluttering. For purposes of diagnosis and therapy the contribution of cluttering to stuttering has to be carefully assessed in every case. By no means all clutterers become stutterers, but I would guess that the number who do is larger than among non-cluttering children.

2) Cluttering, unlike "pure" stuttering, is closely related to other dysfunctions in the language area—to disorders of reading and above all of spelling and writing.

3) A careful history of early development in all areas—perceptuo-motor, linguistic and psychological—as well as an assessment of the symptom itself should enable the clinician to determine whether he is confronted with a specific language disorder or with a psychoneurosis in which stuttering has become part of the individual's defensive system.

4) Therapy is determined on the basis of the diagnostic findings.

Bibliography

Arnold, G. E. 1965. Cluttering: Tachyphemia, in Luchsinger and Arnold, *Voice, Speech, and Language*, Wadsworth: Belmont, California. pp. 598-628.

Bender, L. 1966. Plasticity in developmental neurology, in P. Hoch and J. Zubin (eds.) *Schizophrenia*. New York: Gruen-Stratton.

Bender, L. 1958. *Problems in Conceptualization and Communication*. New York: Grune and Stratton.

Bloodstein, O. 1960. The Development of Stuttering. III. Theoretical and Clinical Implications. *J. Speech Hearing Dis.* 25:219–237.

de Hirsch, Katrina. April 1964. Studies in Tachyphemia: Diagnosis of developmental language disorders. *Logos*.

de Hirsch, Katrina. 1969. Stuttering and Cluttering. *J. of Special Education.* Vol. 3, No. 2.

de Hirsch, Katrina and W. Langford. 1950. Clinical notes on Stuttering and Cluttering. *Pediatrics,* 5:(6).

Freund, H. 1934. Studies in the Relationship Between Stuttering and Cluttering (in German). *Mschr. Ohrenheilk* 68:1446–1457.

Froeschels, F. 1942-43. Pathology and Therapy of Stuttering. *Nerv. Child,* 2:148.

Grewel, F. 1970. Cluttering and its problems. *Folia phoniat.* 22:301-310.

Johnson, W. et al. 1959. *The Onset of Stuttering.* Minneapolis: U. of Minnesota Press.

Lashley, Karl S. 1954. The Problems of Serial Order in Behavior, in L.A. Jeffress (ed.) *Cerebral Mechanisms in Behavior.* New York: Wiley.

Liebmann, A. 1900. *Poltern.* Berlin: Coblenz.

Liechsinger, R. 1963. Poltern. In *Vorlesungen uber Sprach storungen.* Berlin: Marhold.

Masland, M. W. and L. Case. 1965. Limitations of auditory memory as a factor in delayed language development. Paper read at Meeting of the Int. Ass. for Logopedics and Phoniatrics. Vienna, August.

Orton, S.T. 1930. Familial occurrence of disorders in the acquisition of language. *Eugenics* 3:140-147.

Orton, S. T. 1937. *Reading, Writing, and Speech Problems in Children.* New York: W.W. Norton.

Roman-Goldzieher, I. 1962. Handwriting and Speech. *Logos* 2:29–39.

Weil, A.P. 1970. The Basic Core. *The Psychoanalytic Study of the Child,* 25:442-460.

Weiss, D. 1950. Relationship of Stuttering and Cluttering (in German) *Folia Phoniatrica* 2:252-262.

Weiss, D. 1935. Uber die Frage des Polterns und seine Combination mit Stottern. *Mitt. Sprach und Stimmheilkunde.*

Weiss, D. 1964. *Cluttering.* Englewood Cliffs: Prentice-Hall.

Werner, H. 1966. The "latent content" of Heinz Werner's comparative-developmental approach. In S. Wappner and B. Kaplan (eds.) *Papers in Memoriam.* Worcester, Massachusetts: Clark U. Press.

Wyatt, G. 1958. A Developmental Crisis Theory of Stuttering. In *Language and Speech,* Vol. I, London.

Wyatt, G.A. 1969. *Language, Learning and Communication Disorders in Childhood.* New York: Free Press.

Zangwill, O.L. 1962. Dyslexia in relation to cerebral dominance. In J. Money (ed.) *Reading Disability: Progress and Research Needs in Dyslexia.* Baltimore: John Hopkins Press.

The Marginally Ready Child

Jeannette Jefferson Jansky, Ph. D.

Educational Director, The Robinson Reading Clinic
Columbia Presbyterian Hospital, New York City

For some time now I have been interested in the period in the child's life that marks the transition from kindergarten to first grade. I have been concerned with two predictive investigations which intensively studied the kindergarten and second grade performance of some five to six hundred children. In addition, I am currently engaged in the diagnostic testing of many children in this age range, and also have sought out children at this particular stage among those we take on for interventional work. These contacts are sometimes protracted though occasionally they last for only a few months. In any case, we come to know the child and his academic course very well.

All of us have become more aware of the sub-group of five year olds who are clearly, dramatically unready for school, and our tools for identifying them early have become more refined. Here I would like to focus on a somewhat different subgroup of five year olds—those in the gray area, the marginally ready children. I would especially like to consider critically the point of view which proposes that these children be moved ahead because doing so will stimulate them, challenge them, *stretch* them. I would suggest, on the contrary, that while moving ahead may challenge them and stretch them, it may very well extinguish their enthusiasm for learning.

In our diagnostic and remedial practice we also meet children for the first time during their middle school years, when they are eleven, twelve, and thirteen years of age. They come with the complaint that they are close to failing in a number of school subjects. Although they had learned to read at the expected time, they did not read easily, they did not enjoy it, and their very mediocre academic performance never rose to the expectation raised by their often superior level of intelligence.

The characteristic this older group has in common with the younger one

---

This paper was presented at the World Congress on Dyslexia, Rochester, Minnesota, November 1974.

is a rather pervasive immaturity in several or all of the following areas: (1) they appear to lag neurophysiologically, cognitively (in spite of being bright), and emotionally; (2) they are unable to manage verbal patterns set out in space; (3) their memory for verbal sequences and their phoneme discrimination are inadequate; (4) they are marginally behind in comprehension of spoken language; (5) they often present subtle expressive language problems; (6) their scores on standardized reading comprehension tests may range from about the 30th to the 99th percentile; and (7) nearly all of them have trouble with one or another aspect of written expression, especially with spelling. Very often, too, these children are encountering a variety of difficulties interacting with their group.

The children in these two groups are the ones I shall talk about here, kingergarten-first graders on the one hand and the middle schoolers on the other, of both middle and upper-middle socio-economic backgrounds. I believe that the older children we saw had probably been marginally ready as five year olds. I can't prove it of course, but I think the marginally ready child slips past us all too often: he "sort of" learns to read, gradually slides down, and becomes the middle schooler I have referred to. I shall begin with the experience in first grade and then, based on our contacts with children in the older group, shall attempt to project what will happen later on if no one does anything about them.

I have used the term "immature" to describe these children and I have some reservations about it because I am aware that it implies that the children catch up eventually. I want to show just the opposite. However, I feel the term "immature" *is* apt clinically. Children in this group strike the observer as younger than their academically more successful peers. I should add that another group of children, those destined to become severely disabled in reading, are also among this young-seeming group of six-year-olds. Thus, even the group of immatures is heterogeneous. One sees among them those who are a little less immature; in fact, on some days they seem to be as old as their years. The more disabled children are easily identifiable even before they enter school; certainly by their first academic year they will occupy enough of the teacher's time to draw attention to themselves. (Whether appropriate remedial measures are instituted in another matter.) These children, then, are fundamentally able, young-appearing children who present a number of marginal difficulties the effects of which, taken singly, would be insignificant, but in combination do constitute a substantial interference with a successful and enjoyable academic experience. I feel for the children in this group

because in a sense they are exploited. We pass over them because we see that they may be trying hard, and we minimize their problems and do nothing about them.

I am reminded of one little fellow whom we saw several weeks ago. He was six years of age, physically tiny, and struggling to keep up in reading. The school perceived that he was ambitious and that he was a trooper—he was "cool," never complained when he was hurt, and did his best to see that he was on top of every situation. Therefore, they placed him in a group of seven and eight year olds. When the child's mother asked about it, she was reassured that the child loved it and was managing beautifully, and on the surface he was, though inside he was desperate. Given his particular ambitious temperament, he compared himself not to the children nearest his age level, but to the best students in the group; all he could see was that they were miles ahead of him. The school did not want to give him a remedial boost because they felt it would discourage him, but he really did need the additional help. It is in this sense that I feel we tend to take advantage of the copers.

The children in this group are especially responsive to help if it is instituted early enough. Katrina de Hirsch (1974) reiterates the point that performance and achievement are a function of the interaction between maturation and stimulation; time spent early with these children is extremely profitable, not only for what it saves the child in frustration and failure, but also in the saving for the group of what these children have to contribute. On the other hand, if help is not offered early, by the time these children are nine or ten their problems have become as severe as those of youngsters whose early deficits were more obvious. Ironically, many children in this group are just beginning to fall apart when their fundamentally more disabled peers who have been intensively tutored are emerging and moving toward solid academic competency. Thus, this group in which deficits at the time of school entrance are marginal has about the same potential for maladaptation as does the other with inherently more severe problems. The major difference is that for the marginal group the yield in terms of quick remediability is far higher. Therefore, I believe their need for early identification and treatment is just as pressing and the returns are far greater.

Before continuing to describe the way these children look, it would be well to note how demanding first grade is. The child has to fit himself into some sort of schedule or program; he has to be able to sit for long periods; he must respond to the needs of others; he must begin to master extremely complex performances such as reading, writing, spelling, and arithmetic.

These latter tasks represent a second verbal-symbolic elaboration, the first having been spoken language. Fitting comfortably into such a program requires considerable maturity of the child. This is especially true when, as happens so often, he is confronted with a young and inexperienced teacher, for unfortunately, prestige and salary tend to rise with grade level so that the best and most experienced teachers are often placed in the higher grades rather than in the lower ones where they are most needed.

In view of all that will be demanded of first graders, it is well to stress the need to look for symptomology in a wide range of behaviors. One reason children in this group are missed is that a perfunctory assessment of one or two areas of functioning may easily suggest that all is well.

I believe that two easily obtained pieces of information should alert the examiner to look further. These are a history of premature birth and chronological age. Prematurity has, of course, been investigated extensively as a contributor to learning disorders. The assumption is that many of these youngsters who start out life as immatures have not actually caught up by the time they enter school. I refer above all to the work of Kawi and Pasamanick (1958). In a study that Katrina de Hirsch and I (1966) completed a number of years ago, we found that 50 to 60 percent of the prematurely born children in our sample were failing in reading by the end of the second grade. There does seem to be a correspondence between birth weight and academic functioning.

We also look very carefully at chronological age. I am fully aware of the essentially negative correlation between chronological age and performance (see Jansky and de Hirsch 1972), but I am not sure that our studies of this variable have been differentiated enough, because we have tended to look at it as an isolated factor rather than as it interacts with other variables such as sex, cultural and economic background, and various deficits. I am really hesitant about recommending that children and especially boys with fall birthdays go on into first grade. They may be bright and may well learn to read, but they may not be ready for the demands for restraint and for the need for socialization with which they will be confronted. Some parents, aware that their children are very bright, insist upon early entry into first grade. One five and a-half year old was sent along too early and cried desperately every day during the first two weeks of school. This happened years ago and as it turned out, the girl in question maintained a straight A average right through college. However, as she said several years ago, "I was badly off socially from the first, but I was worse off in sixth grade than I was

in second, and worse again as a high school senior than when I was in sixth grade." Only her readiness for socialization was marginal. (Fortunately she had the good sense to remember it all and sent her own very bright son, who has a December birthday, to school when he was nearly seven.) Waiting until the child is older to send him to school does not by itself necessarily resolve marginal difficulty but it may help. With children for whom reading difficulty is a virtual certainty, we are hoping, among other things, to buy an additional year during which we can focus on preventive work in circumstances of reduced pressure. During the past twenty years I have observed that postponing first grade entrance usually helps and have heard only one complaint. It was from a mother of an intellectually gifted adolescent girl—whose schoolwork was excellent. However, her mother felt that the fact that her daughter had achieved puberty rather early served to further separate her from the group in which she was chronologically older to start with.

Many of these marginally immature children at six look very young. Their faces and bodies tend to have the soft, rounded contours of the toddler. Frequently their motor responses are global. When seated sometimes they assume the posture of a younger child and work with one arm bent at the elbow and with the hand held close to the head. They may hold the pencil in a flaccid grasp and be quite unable to move it in a differentiated way. When one part of them moves, all the rest of their bodies tend to move, too. They look almost a different species from the five and six year olds who sit competently at the table and take charge of the situation.

The ability to sit comfortably is important for the child who begins school. He must be able to relegate distracting internal and external stimuli to the background if he is to be able to focus on the work at hand. The need to move can represent a powerful urge and can be quite preoccupying during times when a child should contain himself. Children so preoccupied find it hard to listen and to give themselves to activities that are removed from their direct physical involvement. Paper work may have little attraction or meaning for children who need to move a lot. A child in this category can play actively in the park for a half day without seeming to tire, yet when confronted with table work he will fatigue rapidly. One can almost feel the enormous effort that sitting requires. Because control of motility is a function of development, one can expect it to become easier for the child to sit with each successive year; and so delaying school entrance can make a great difference. But again, it is a matter of weighing many considerations.

I am reminded of a classroom of first grade boys that I visited about

twelve years ago. In the first place, the whole room seemed to be in motion—no one was really sitting quietly. Feet were tapping, people were squirming, there was a certain amount of exuberant shoving and kicking, even though a good deal was being accomplished. But there were two little boys I remember clearly. One interrupted the teacher frequently, stood on his seat supposedly to reach something, and suddenly raced out of the classroom. As I later learned, he darted up to the library to retrieve a toy. I know the boy and when one walked down the street with him he was always in too much of a hurry to wait for traffic lights; at birthday parties when excitement was high he simply could not respond to verbal restraint. Learning, however, was never a problem for this boy because he was highly intelligent, extremely curious, had a strong investment in completing what he started, and had endless energy for outside projects. As a tenth grader, he assembled a harpsichord from a kit that he had bought with money won in poker and roulette games that he had organized during study periods. He is top boy in a very bright senior class and has written a wonderful essay about Mozart. He has had a number of brushes with school authorities and for a while had some trouble with the group because of his overbearing manner and competitiveness. He has worked it out now, but his mother says that socially he has always been about a year behind his peers.

The second first grader has not fared so well. I remember watching him work in his math workbook—not in his seat, but standing with book pressed against the wall, moving as he worked. This youngster proved to be too distracted to learn; the desk held little appeal for him. He has never actually failed, but he has often been on probation and had to be tutored during his seventh and eighth grade years. He was one of the boys who continued to engage in physical roughhousing after most of the others stopped. He was an excellent athlete and was happiest when he was on the playing field. In class the others groaned when he asked questions because they had so little to do with what was going on. I have always felt that this second boy would have been more ready to learn had he started a year later.

We see many children who impress us as bright and who do well on IQ tests but who are nevertheless intellectually immature. By this I mean that although they may be able to perform maturely long enough to do well on a test, this is not their habitual manner of functioning. If one watches them at play one sees the extent to which they are bound to fantasies of a magical and wish-fulfilling kind. Such fantasies are perfectly normal at this age and even later—the difference is one of degree. Oddly enough, I do not think

these children are necessarily neurotic. It is simply that external reality has little hold. Animals speak, inanimate objects move. The constraints of the object world have not yet been accepted. The children's waking logic is not much different from their dream logic. To use Piagetian terms, they have not moved far toward the level of concrete operations; in Freudian terms, they are still bound to primary process thinking. Their world view is egocentric and very colored by their own needs and fantasies. If one administers a Wechsler Preschool and Primary Scale of Intelligence test to such a child, his performance may be variable even for a five year old. Some children who score quite high at the age of eight or nine simply cannot handle this kind of test as preschoolers. This is especially true of the intellectually immature child. Although he might do well on another day, at the time of testing he may see no need to assume a different attitude from his habitual one. If he is taken away from amusing play, he may be more preoccupied with returning to it than with cooperating with an unfamiliar adult. He is not too much interested in telling what a moth is, or in saying why it is better to build houses of brick than of wood. Asked to complete the sentence, "A knife and a piece of broken glass . . . " he may launch into a personal anecdote. Many children simply have not learned to play by consensually validated rules. If it is difficult to do so when the child is being tested, one can imagine that learning arithmetic and reading, both activities that work by rules, would impose very heavy burdens. The teacher feels that the child is bright, but she is frustrated because he does not produce. She may conclude that he is lazy or distracted, or that he daydreams. The youngster himself feels that school work has little meaning. Learning to add makes no sense to this child; he doesn't need to add. If you watch such children in class they seem a little apart from the group—they look out of it. While the child in the next seat is busily at work and readily sees the connection between five plus five and what two nickels make, our child does not. The second child may already be involved with acquisition and may nag endlessly for an allowance and then haggle with his parents over terms. The intellectually immature child might not care about money or what it can buy. Events occur or they don't mysteriously—cause and effect don't exist. The how and why of external events is less significant than the way they coincide with fantasy. This child sees himself less as an agent than as an object. If things go his way it may seem to him more a fulfillment of his magical wishes than a function of what he has or has not done. The intellectually young child is capable of a different mode of thought, but it is not particularly comfortable for him. The result is

that he concludes that school is "hard," an attitude that tends to become entrenched during the subsequent years.

Many of these children are emotionally immature as well. Again, one should distinguish between this particular kind of emotional immaturity and neurosis in which conflict interferes with emotional development or else results in regression. I don't deny for a moment that many in this group are also neurotic—I say only that this is not the characteristic I am referring to now. The immaturity of children in this group appears to be part of their general organismic condition. They are not necessarily off schedule for themselves, inasmuch as they have made steady forward progress, if at a slower pace than some of their contemporaries. Their timetable is simply different. The first thing one may notice is that their interests are "young." They may be preoccupied with food and drink and will do better when fed. They often eat rather messily. Many of them are oriented toward play. Table activities are seen as work and they look longingly at the toys. Moreover, they find it hard to understand why they cannot play immediately. They seem not to have moved very far toward postponing immediate gratification in the interests of long term gains. They have not come to view mastery of such activities as school work as an end in itself. They do work at mastery, but at a younger level. One also notes the wrench when these children are called upon to separate from mother. They seem to feel that she forms a necessary base of operations and, accordingly, they lack a strong sense of themselves as independent and autonomous.

Because self-regulatory functions are not well developed they seem unready for the demands of the classroom. Schedules are difficult and they are out of step. They have trouble organizing their work to finish at a certain time. They can't keep track of their possessions, whether books, clothes, or toys; their sense of property is weak because their sense of self as owner is tenuous. Their ability to work by themselves is negligible. They make a few gestures in the direction of the assigned task and then fade out. They mix up directions or get off on the wrong page. The academic experience is virtually meaningless. They are the despair of the conscientious teacher. The trouble is compounded when she feels she has to get such a child to the level of the group by the end of the year. When she increases demands she finds him still more elusive. When such a child is overplaced he may cling to infantile adaptations which become less and less appropriate. It is at this point that one can talk about neurosis.

On the other hand, when demands are postponed for a year, sometimes

the same child can make a far more comfortable transition to formal education. His sense of himself is more clearly experienced and his command of himself better developed. He feels more powerful and thus can impose order and structure more effectively. The work becomes his work and the accomplishments are his.

Now let us look somewhat more closely at the immature child's performance in specific areas and at the subtle deficits that may signal interference with learning.

Pencil control may or may not be difficult for him. If there is a problem, often it is not one that stops him completely. It may be no more substantial than to require somewhat more effort to present acceptable work.

The human figure drawing may be well or awkwardly done. This test has never been a very good predictor of subsequent performance, though it is clinically interesting. Frequently these children's drawings are rather simple, unelaborated figures that are reasonably coherent but appear to be slightly fragile. Or bodies may be substantial but legs' and arms' attachments are loose. When personality is introjected, it may be shown in the stance or position, rather than by specific detail.

The children's copies of the Bender designs usually suggest lags. Troubles with synthesis, angulation, and spatial arrangement are common, though these may not be striking.

Little may show up in the way of auditory discrimination or word blending problems. However, these children's memory span for sentences may be short and they frequently have some trouble following syntactically complex instructions. This may exist in the absence of difficulty with overall oral language comprehension. Frequently, however, such children are rather quick to pick up verbal absurdities.

Their spoken language tools may appear to be adequate at first. And yet, even if articulation is all right and delivery rhythmic and natural, one often notes that these children are not really articulate. They may talk a great deal but they speak rather clumsily. That is to say, there is little use of other than simple or compound sentences; there are many sentence fragments and there are frequent phrase repetitions that appear to be a function of some difficulty with formulating what they want to say. Very often they may begin a statement, have trouble with it, and return to have another try. There may be occasional sophisticated constructions, but simpler ones predominate. There seems to be more than the usual trouble with irregular forms of the past tense and it is very rare that dysnomic features are absent. That is, these children

tend to grope for words, to misname, and to overuse pronouns. They rely heavily on gestures. Organization may be poor, so that the stories and anecdotes they tell tend to be fragmented and disjointed or barren. Such children may use a buck-shot approach, including many details while highlighting nothing. The oral language problems of these children almost always pass unnoticed because most of them speak fairly clearly and talk a lot. Actually, articulatory competence and number of words are rather poor predictors of academic performance, while some of the linguistic variables are good indicators.

These children's work on standard measures of reading readiness may be passing and is sometimes better. They often know the alphabet letter names; they match words fairly easily; they rhyme relatively well; they don't do badly at word-learning tests. A child may even know his letter names and may read and write a few words, yet when attempting to spell a word he has just learned, he may write it backwards.

In trying to summarize observations about part-performance in areas related to reading of children who are marginally ready, one notes a fair degree of competence in the instrumentalities. That is, the children in this group can handle a pencil well enough to write fairly comfortably and they can handle small verbal units—the phonemes. Specifically, they may discriminate and blend well. They speak distinctly, and without an inordinate number of sound distortions or substitutions. Furthermore, they often know their letters and can rhyme and match. In short, they seem reasonably ready to learn to cope with a phonics approach to reading, which requires the ability to manage phonemes. These are the skills that are stressed in the early grades and many of the immature children I am speaking of can pick up such techniques with a minimum of effort, even though they are hyperactive or somewhat infantile. In fact, this knack for phoneme management is often the reason they escape the attention of the remedial specialist during the early school years, and if the first grade teacher relies heavily on a phonics approach it is all the better for them because they are ready for it. When a look-and-say approach is used, they may fare less well.

However, on the long run, obviously more is demanded both behaviorally—above all in terms of autonomy and ability to invest effort—and linguistically. Many of our schools do not really emphasize comprehension skills until the third or fourth grade and it is here that the child with the subtle linguistic gaps compounded by neurophysiological or emotional immaturity may begin to have serious trouble with functioning. Although they

do not have much difficulty with sounds, many of them do have trouble with syntax, and on several levels. Their sentence memory spans are short, they have some trouble following grammatically complex directions, and their own sentences are often fragmented and poorly constructed. We find that the group of children we meet for the first time during the middle school years has trouble with sentences and that this interferes with reading comprehension.

By this time their spelling scores may be dropping. It is not that their spelling ability is deteriorating, it is that the spelling tests become more demanding. Some spelling tests for the early grades tend to be made up of words with high phoneme-grapheme consistency, that is to say, of words which are spelled the way they sound. The exceptions are frequently used words that are included in most spelling lists. However good our youngster was at managing phonemes, his visual perceptual skills, which are heavily implicated in spelling, and above all in writing, were less than outstanding, judging by his marginal Bender Gestalt score. There are too many words that do not go by the simple rules, and the accumulation of so-called sight words is by now overwhelming. If one looks at the child's mistakes, one does not see distortion of the sound character of the word; one sees small errors in grapheme arrangement, such as the dropping of a doubled letter, or the use of one vowel instead of another in a suffix when both sound like a *schwa*, that is to say, are unstressed.

How would an older immature child look when referred to us as a sixth or seventh grader? I am reminded of a boy named John whom I worked with a number of years ago. John was an only son and very much wanted, the youngest of four children of extremely affluent parents who lived in the suburbs. His father had had a reading problem as a boy but overcame it when faced with the threat of being dropped from prep school. We learned that John was a full-term child with a spring birthday. He had started at a local public school, and although he had learned to read there, his parents were convinced that it had been a bad experience for the boy because he had been permitted to wander around a lot and had never been forced to tend to his work. They transferred him when he was ten years old to a very demanding boys' school in the city. He repeated the fourth grade at that time. Even though he did so, and even though he was tutored intensively summer and winter, this child of superior intelligence was barely passing. The teachers criticized him because they felt that he was lazy and the other boys found him too reserved. I noted that John was a relatively quiet person—very tall

and quite heavy. He had a poor opinion of himself. He had accepted the adults' judgment of him as lazy and disinterested and it was obvious from our early conversations that he had found nothing of value at school.

It was fascinating the way John separated his very serious hobby from school work. He had amassed a wealth of information about marine life, he was an accomplished scuba diver, and he had done a lot of work with his father to save the green turtle, which was becoming extinct in the area where they had a summer place. Yet John felt that this highly intellectual interest had nothing at all to do with learning or with school and he could not make the connection in terms of the quality of investment and commitment between the one and the other.

Although he read fluently, he had trouble making out the longer words and he did not know their meanings in many cases. What was even more striking was his difficulty in interpreting complex sentences in his history book. I found that when I rewrote these, using the same vocabulary but changing the grammatical format to simple and compound sentence types, the comprehension problems were eased considerably. John's spelling was about a year behind grade level. His compositions were short; he complained that he did not know what to say. His papers were poor technically, inasmuch as he omitted words and forgot about punctuation. They were also dreary and unimaginative.

John had a problem with homework. When he tried to do it he couldn't concentrate, and he procrastinated. He wasn't allowed to watch TV during the week and he had to remain in his room until his assignments were finished. However, he found this no hardship, for his room was a small reptile house. He had a number of lizards and several kinds of snakes. There was a boa constrictor in a large case in his bathroom, and John spent a good deal of time applying the medication it needed for its mouth fungus.

John didn't get along very well with his classmates. About the only thing he did with them was to play soccer. They thought him rather slow and he regarded them as threatening in a vague sort of way and quite different from him. He envied their freedom to go about the city, but would have been afraid to do it himself. He disapproved of their political views which he felt endangered the basic values of the country. I won't go into family dynamics, but there were problems. Each night at the table John and his mother were entertained by the father's heated political lectures. John, who loved his father dearly, had adopted his points of view but he didn't have their rationale because he usually did not listen carefully enough to follow it.

Altogether, John was turned off, and for many reasons, which is the point I want to make. *If* he had been given the extra year before the first grade instead of before the fifth, he might have been able to settle down and school might have seemed easier; *if* his perceptual and verbal skills had been somewhat more advanced he might have been able to make it despite his need to move about; *if* learning had not been so threatening to the values of the adult who was important for him, he might have been a better listener.

In John's case, perceptual difficulties were less significant than linguistic ones. He was one of the youngsters with semantic and syntactic weaknesses and these contributed to his trouble with comprehension and expression. He didn't have much trouble with phonemes.

Sometimes the balance is in the other direction. I am thinking of Alan, an eight year old youngster whom we met several weeks ago. Alan is a third grade student in one of the boys' schools in the city. He was referred because of his difficulties with spelling and writing and it was noted that he is hyperactive. He gets into fights constantly and is considered hostile to the other children and teachers. He was described as a good reader.

We learned that Alan, whose birthday is in September, was prematurely born; he arrived six weeks before term although his birth weight was somewhat above five pounds. It was reported to have been a difficult, dry birth. The child was hyperactive from the start and not very cuddly, always on the go. His parents are divorced.

Alan was seen by the school psychologist during his second-grade year because of the reported behavioral difficulties, not because of any academic problems. The psychologist found the boy articulate and delightful, and noted that he had a good deal of insight into his unacceptable behavior. She concluded that it was probably basically a clash between the boy and the second grade teacher.

At first Alan impressed me as a very deviating and angry child. When I found him in the waiting room he was making faces, gesturing, and muttering to himself. In my room he immediately dashed to the balckboard and began to draw and he was not particularly responsive at first to my requests that he sit down. Once the contact was made, however, he handled himself well and very much as the psychologist had described, though he did continue to be restless and active.

In fact, his motility patterning generally was that of a younger child. Alan readily turned along the longitudinal axis when his head was rotated, concomitant movements were noted, and his body moved globally and jerkily

when he walked and ran, and there were signs of poorly established cerebral dominance. Nevertheless, Alan was considered a good athlete and relished body contact sports.

Alan's human figure drawings and copies of the Bender designs bore out the motility disturbances noted above. The figures had a writhing quality that is typical for children of this sort—and there were important spatial difficulties.

By contrast, his processing and expression of spoken language was excellent. He understood the subtlest jokes and spoke easily. His choice of words and his sentence construction were excellent and his summary of a Bruce Lee movie was accurate, vivid, well organized, and detailed.

His relative standing in reading and written work mirrored the strengths and weaknesses just described. Alan scored at the seventh grade level on a reading vocabulary test and at the sixth on a test of reading comprehension. His spelling, on the other hand, was barely second grade level. His handwriting was ghastly—wild, disinhibited, and angry-looking. He did not know how to form some letters and used a combination of capitals and lower case forms. His spelling errors included transposals and poor recall of the arrangement of graphemes. For the most part, the spelling was at best "phonetic." The first story he wrote was done so hastily that he made no attempt to use sentences. Earlier Alan had informed me that this was the way he liked to write—the only way—without having to think about writing, spelling or capitals. The second story, over which he took more trouble, contained well formulated sentences though one tended to overlook this because his handwriting and spelling were so poor.

I felt that Alan's motility and coordination problems contributed significantly to both academic and social difficulties. I do not think they were the only cause and I never got to know Alan well enough to learn more about his hostility. I did know that the group at school overstimulated him and set him off behaviorally and that in a one-to-one setting he got enough support to muster his compensatory resources so that he could cooperate. It is true, too, that Alan has a number of school friends with whom he gets along well when he has them one at a time.

But again, it was the spread of difficulties that did Alan in. *If* he had gone to school a year later he might have fallen into the routine more easily—and he would have been doubly entitled to waiting in view of his fall birthday and his prematurity. And *if* he had been able to sit better and had been less impulsive, he would have been better able to compensate for

difficulties with grapho-motor control. And *if* he had been less angry, his hyperactivity would have been less upsetting to the group.

There are several points to be made here. *First*, these immature older boys did not present just one or two areas of vulnerability, they presented several. *Second*, difficulties had been present all along and were clearly observable when the children were five to six years old. Thus, they might have been singled out earlier. *Third*, John's learning disability was more pervasive than Alan's although Alan's primary deficits were more severe. John was in more trouble than Alan because he was older. Inappropriate coping strategies had become entrenched and emotional and specific features were so intertweined as to be difficult to untangle. By the time we saw both of the boys, they had suffered failure and humiliation which affected their opinions of themselves; these feelings in turn set in motion ways of responding which were maladaptive and got them further into trouble. *Fourth*, both boys had much to offer to their groups but this was largely or completely lost. John's information about his experiences with the turtles and the opportunities along these lines he could have offered the group went entirely by the board. Alan's verbal and literary gifts were virtually unrecognized. And *fifth*, had these gifted boys been singled out for some kind of intervention early, their gifts and talents were such and their difficulties taken singly were relatively so mild that it would have been fairly easy to help them.

We have had a number of experiences of success with early intervention for marginal children of this sort. These children were very easy to treat and responded quickly. We felt we had a great deal to work with and that the result was readily achievable.

I am not suggesting that we give these children preference when alotting treatment hours. If it is urgent to identify marginal youngsters properly, it is even more so for children with potentially serious learning disorders—the latter should be picked up even before they enter kindergarten if we are to help them adequately. All I am saying is that we should not overlook the marginally ready, or the immature child. I am really speaking against waiting to let maturation take its course. If we pick them up, the worst that can happen is that they get help they did not really need. Inclusion in a program will not hurt them and it will soon become apparent if they do not need it and other arrangements can be made for them. The danger is, on the other side, that what may appear to be false positives in first and second grade may become true positives by third or fourth.

What adequate intervention requires, in the first place, is a school system

that is prepared to recognize, in operational terms, subtle differences between children in readiness. This means provisions for assessment and for differential management. It really does not require money as much as awareness, a commitment to teaching, and the flexibility necessary for making changes as these are needed. We have seen startling progress effected in schools with very tiny budgets.

Areas that should be watched when assessing readiness are, in addition to birth weight and birth date, level of cognitive, emotional, and neurophysiological maturity, and status in grapho-motor, perceptual areas, as well as the child's ability to handle spoken language. Assessment of the latter should be fairly inclusive and should cover processing ability, comprehension, and facility in managing phonemes, words, and sentences.

It isn't so much the presence or absence of a particular subskill that matters, as the interaction of strengths and weaknesses. Does the child handle himself comfortably enough to undertake the first grade with enthusiasm, relative ease, and a much better than even chance of success?

It is helpful to keep in mind a picture of the child who is successful and who enjoys school. What is impressive about him is the sense of confidence he exudes. He goes about his work with pleasure so that one feels he likes what he is doing in class at least as much as what he does outside. Obviously we cannot guarantee each child this experience, but we can come closer than we have. And in the case of marginally ready children, we can do it easily if we start promptly.

Once children are identified as needing additional attention, this can best be provided by the school itself. In contrast to the situation with children who have potentially severe learning disabilities and need individual help, most immature youngsters can be worked with in small groups. Just which arrangements are made to give the child more time will be a matter of individual school policy, but it is a crucial consideration and should not be ignored.

Very important to the success of early intervention efforts is working with parents. They need to learn about normal developmental differences between children and how their school deals with them. Parents' anxiety about departing from the classical educational timetable is keen and we must recognize and help them with it. Doing so is a matter of firmly establishing and fully interpreting school policy, not of holding a single meeting.

When we see the older child who is in trouble, along with his discouraging and complex array of problems, we wish somehow for a pill to be

invented that would cure him instantly. And by the way, that is what the children wish, too, and the parents, and the teachers—that something would make it all go away as quickly as possible. Unfortunately this wish has given rise to a number of highly publicized but simplistic treatment approaches which have little hope for success because they are too narrowly directed. Careful research has shown that the best approaches are those aimed most directly at mastery of the performance itself. This is basically a pedagogic responsibility.

One of the good things to come of taking the long view is what the child learns about himself. He has a rather unique opportunity to learn that he can handle a difficult and frustrating problem. He has learned that wishing it away made him no better, but that by working at it, he is farther along than he was a month ago, and still farther than he was a year ago. His mastery gives him a sense of confidence that nothing else will—not all the praise and encouragement in the world. As young adults, our former clients frequently tell us that once they learned that they could read and spell, they realized they could learn anything they had to know, and that they could get great satisfaction from their intellectual efforts.

References

de Hirsch, Katrina. 1974. Language Development, In S. Arieti, ed. *American Handbook of Psychiatry, Second Edition.* Volume I. Chapter 16.

de Hirsch, Katrina, Jeannette Jansky, and William Langford. 1966. *Predicting Reading Failure.* New York: Harper and Row.

Jansky, Jeannette and Katrina de Hirsch. 1972. *Preventing Reading Failure.* New York: Harper and Row.

Kawi, Ali and Benjamin Pasamanick. 1958. Association of Factors of Pregnancy with Reading Disorders in Childhood. *J. Amer. Med. Assoc.* 166:1420–1423.

Early Speech and Language Problems

Sister M. Winifred Danwitz, Ph.D.

Associate Professor of Special Education Graduate School, College of New Rochelle, and Director, Mt. St. Ursula Speech Center

In a mysterious manner children learn to understand and speak the language they hear around them. This process still defies our comprehension, despite extensive and intensive studies of language acquisition. While we cannot explain *how* the child masters language during his first five years of life, it is obvious that 90–95 percent of children do attain this goal, most of them receiving little or no direct teaching, some helped by very good teaching, and some triumphing over the interference of very poor teaching or of more serious handicaps.

Normally language develops as the result of the interaction between a well-integrated organism and a supportive, appropriately stimulating environment. The child needs intact peripheral organs for receiving auditory, visual, and tactile stimuli, and an intact central nervous system to react to those stimuli by interpretation, association, and response. Some degree of intellectual development is also necessary for language acquisition, which in turn promotes further intellectual development. Concomitantly the child's body concept, spatial orientation, visuo-motor skills, and figure-ground discrimination develop as a basis for language, as well as a reflection of the language the child has mastered. For the optimum development and interaction of the organs and functions involved in language acquisition, the child needs an environment which promotes his emotional stability, giving him the security to explore his surroundings and to form interpersonal relationships.

Fortunately even a somewhat impaired organism in a less than ideal environment can develop adequate language, and we find that a five-year old child's typical verbal output is 10,000–15,000 words per day of grammatically correct, meaningful communication, drawing on a vocabulary of about 5,000 words. His comprehension of spoken language may encompass a

This paper is a summary of a one-day Institute presented at the World Congress on Dyslexia, Rochester, Minnesota, November 1974.

vocabulary three times this size, as well as grammatical structures he does not yet use expressively.

In view of the fact that language is almost universally acquired with considerable regularity, the child who fails to attain the usual linguistic development warrants our attention. His failure may be an early and sensitive indicator of sensory, neurological, intellectual, or emotional problems. Consequently, a two-year-old who does not use two-word phrases or cannot follow a simple command, a three-year old who does not use three- or four-word sentences, a four-year-old who cannot be understood when he speaks to persons outside his immediate family—all should have a careful professional evaluation to determine the nature and extent of the problem.

Such an evaluation, besides reviewing the history of the child's health and development, would assess each aspect of the child's communication. Through this assessment we seek answers to a few key questions:

1. Where has the communication process broken down?
2. What *can* the child do? What are his best areas of functioning and his best sensory modality?
3. What can the child *not* do? What areas of functioning cause difficulty?
4. How does the child try to compensate for his deficits? What response does he make instead of the correct one?
5. If he does not try to compensate, why not?

Keeping in mind both the cognitive and the emotional processes involved, we focus in turn on the child's hearing acuity, concept development, receptive language, expressive language, voice, articulation, auditory and visual memory, body concept, spatial orientation, visuo-motor skills, figure-ground discrimination and laterality; when appropriate, the academic skills of reading and writing are also assessed.

One of the most serious problems which the evaluation may reveal is a receptive language disorder, resulting from a dysfunction in processing what the ear has heard. A receptively impaired child is unable to interpret the spoken word and to use it meaningfully. Although he may have good auditory acuity, his difficulty in discrimination, memory, sequencing, perception, association, and synthesis of the sounds he hears interferes with his understanding of their meaning. This disorder can range from a complete lack of ability to interpret spoken language to a subtle deficit which may remain unidentified while still impairing the child's communicative ability.

Obviously, children who cannot understand the language they hear will show deficits in their expressive language. However, expressive language disorders also occur in children whose receptive language ability is intact. Expressive language dysfunctions are manifested by poor naming ability, word-finding difficulty, incorrect grammatical structures, and disorganized verbal expression. The child's verbal output may be very limited or it may be excessive but of poor quality.

Expressive language disorders are frequently found in children who have been referred for evaluation because of their defective articulation. Although articulatory disorders may also occur in children with otherwise normal language functions, poor articulation is usually associated with some other dysfunction—sensory, motor, cognitive or emotional. Articulation defects, often more obvious than deficits in receptive or expressive language, may prove to be the "tip of the iceberg" when we study a child carefully.

Frequently underlying an articulation disorder we find a hearing deficit, recognized by neither the child nor his parents. Fluctuating hearing losses, which often occur in young children, may remain undetected while interfering with the child's speech, language, and learning. Even a slight depression in a child's hearing level may have significant effects on his academic performance, although it may not greatly affect his speech and language.

Language plays a central role in a child's early cognitive growth, his personality development, and his academic achievement. Because of the interrelationship among perception, concept formation, and language, and the concomitant development of these three functions, the language-impaired child will often show cognitive deficits. His ability in reasoning, problem solving, categorizing, generalization, and abstraction will be limited by his language ability. Idioms, figures of speech, and humorous expressions may perplex him.

An inability to communicate easily and effectively with those around him usually produces some adverse effects on a child's personality. A language-impaired child may not understand his mother's early words of affection, reassurance, and approval which are essential for his normal emotional development. When coping with language becomes too difficult for him, he may react by exploding into a tantrum or by "tuning out" the overburdening sounds and withdrawing from communication. Because he lacks the language for self-regulation of his behavior, the child may be impulsive and uncontrolled. The lack of adequate language for asking questions, for expressing feelings and emotions, and for exerting some control over his environment can result in frustrations detrimental to wholesome personality growth.

If a child entering school has not mastered language, the indispensable tool for all his further learning, he faces academic failure. About 75 percent of the young child's school day is spent in listening and speaking, and at least 85 percent of the instruction is given through the spoken word. Learning to read and write a language he cannot understand and speak at his age level is a formidable task for a child; the ability to recognize and use the phonological, semantic, and syntactic patterns of a language is fundamental to learning to read that language. It has been clearly demonstrated that children with deviant language development form a high risk group for later reading and learning difficulties. Even a moderate language deficit can be a serious obstacle to learning to read, while a minimal language deficit can interfere with efficient reading. There is a high correlation among listening, comprehension, proficiency in oral expression, and reading and writing abilities.

Since disorders of communication have the potential to generate further dysfunction—intellectual, emotional, and academic—early speech and language problems should be heeded as warning signals. The sooner these disabilities can be treated, the less damaging their effects. In the pre-school child, the late onset of language, poor comprehension, or expression which is poor in quality and limited in quantity should alert us to the possible need for remediation of a disorder of communication, as well as for a program designed to prevent later academic disabilities. In a young school child, however, the difficulties in coping with the curriculum may be the primary cause for concern, while the underlying disorder of communication may remain unrecognized. Such a child should always be referred for a thorough language, speech, and hearing evaluation, followed by whatever special services may be indicated.

The earlier our response to the warning signals, the better is the child's chance to function ultimately at his optimum potential in all aspect of his life. Early remediation of speech and language disorders usually proves more effective and demands less time and effort than treatment begun later, and saves the child from the frustrations and penalties of failure in a society which relies heavily upon verbalization.

References

Bannatyne, A. 1971. *Language, Reading and Learning Disabilities.* Springfield, Illinois: Thomas.

Bar-Adon, A. and W. P. Leopold. (Eds.). 1971. *Child Language: A Book of Readings.* Englewood Cliffs, New Jersey: Prentice-Hall.

Berry, M. F. 1969. *Language Disorders of Children.* New York: Appleton-Century-Croft.

Carroll, J. B. 1964. *Language and Thought*. Englewood Cliffs, New Jersey: Prentice-Hall.
de Hirsch, K., et al. 1966. *Predicting Reading Failure*. New York: Harper & Row.
Denckla, M. B. Language Disorders. In J. A. Downey, and N. L. Low, (eds.). *The Child with Disabling Illness—Principles of Rehabilitation*. New York: W. B. Saunders Co., 1974.
Irwin, J.V. and M. Marge, (eds.) 1972. *Principles of Childhood Language Disabilities*. New York: Appleton-Century-Crofts.
Jansky, J. and K. de Hirsch, 1972. *Preventing Reading Failure: Prediction, Diagnosis, Prevention*. New York: Harper and Row.
Johnson, D. J. and H. R. Mylkebust. 1967. *Learning Disabilities: Educational Principles and Practices*. New York: Grune and Stratton.
Kastein, S. and B. Trace, 1966. *The Birth of Language*. Springfield, Illinois: Thomas.
Luria, A. R. 1961. *The Role of Speech in the Regulation of Normal and Abnormal Behaviour*. New York: Liveright Publishing Corp.
Michal-Smith, H. and S. Kastein. 1962. *The Special Child*. Seattle, Washington: Special Child Publications, Inc.
Piaget, J. 1959. *The Language and Thought of the Child*. London: Routledge and Kegan Paul.
Vygotsky, L. S. 1962. *Thought and Language*. Cambridge, Massachusetts: the M.I.T. Press.

Some Predictive Antecedents of Specific Reading Disability: A Three-Year Follow-up

Paul Satz, Janette Friel, and Ron A. Goebel[1,2]

University of Florida
Gainesville

This paper reports the third year criterion follow-up of a total population of boys (N = 497) who were tested at the beginning of kindergarten in 1970 on a battery of developmental and neuropsychological measures which were designed to forecast later reading achievement at the end of Grade 2 (1973). The purpose of this research is to evaluate a theory of developmental dyslexia which purports to identify the early pre-reading precursors of dyslexia (Satz and Van Nostrand, 1973). The results, based on linear discriminant function analyses revealed a high predictive classification of children—especially those destined to both extremes of the reading distribution in year three. The results, which were compatible with the underlying theory, were converted to utility tables to demonstrate their application for early intervention decisions by educators.

Problem

The present study is addressed to the results of the third year longitudinal follow-up of an original population of 497 white male children who

---

This paper was presented at the World Congress on Dyslexia, Rochester, Minnesota, in November 1974.

[1] Research supported in part by funds from the National Institute of Mental Health, Behavioral Sciences Research Branch (MH 19415).

[2] The authors gratefully acknowledge the collaborative assistance of the Alachua County School System. Special appreciation is extended to Dr. Jack Christian, Assistant Superintendent of Instruction, Dr. James Longstretch, Superintendent of Schools, and their respective staffs. The continued cooperation of the children and their parents, even after relocation elsewhere in the United States, is most especially appreciated. A final appreciation is also extended to our staff, particularly to Mrs. Fran Rudegeair.

were tested at the beginning of kindergarten in 1970 in Alachua County, Florida. The purposes of this research project are: (1) to test a theory (Satz and Sparrow 1970; Satz, Rardin and Ross 1971; Satz and Van Nostrand 1973) which purports to identify the predictive antecedents (i.e., precursors) of developmental dyslexia (specific reading disability) several years before the disorder is clinically evident and (2) to evaluate the mechanism which is postulated to underlie and influence later developmental changes in this disorder.

The present study is addressed to the first objective (i.e., early detection), because not enough time has elapsed in the longitudinal project (three years) in order to investigate the developmental course of this disorder after the reading disability has been diagnosed and confirmed.

The theory has been extensively discussed in previous papers (Satz and associates 1970, 1971, 1973) and an evaluation of the first and second year follow-up predictions are presented in two recent papers (Satz and Friel 1973; Satz and Friel, 1974). The theory, in brief, postulates that developmental dyslexia reflects a lag in the maturation of the brain which delays differentially those skills which are in primary ascendancy at different chronological ages. Consequently, those skills which during childhood develop ontogentically earlier (e.g., visual-perceptual and cross-modal integration) are more likely to be delayed in *younger* children who are maturationally immature. Conversely, those skills which during childhood have a later or slower rate of development (e.g., language and formal operations) are more likely to be delayed in *older* children who are maturationally immature.

This lag in brain maturation is postulated to delay the acquisition of those developmental skills which have been shown to be crucial to the early phases of reading—learning to differentiate graphic symbols (Gibson 1968) or perceptual discrimination of letters (Luria 1966). Both authors recognize an orderly and developmental sequence in which the early phases of reading are characterized by processes of perceptual discrimination and analysis. In this *early* phase the child must discriminate the distinctive features of letters (e.g., break vs. close, line vs. curve, rotation and reversal) before he can proceed to later phases which require more complex phonetic and linguistic analysis.

Thus, the theory postulates that those developmental skills which are in primary ascendancy during the pre-school years are, if delayed, more likely to forecast later problems in reading and writing by Grades 1 and 2. Preliminary support for the theory (i.e., early detection) was demonstrated in the second year follow-up of children in this longitudinal project (see Satz and Friel

1974). Although the criterion measures for reading achievment were judged to be premature (Grade 1), the tests given in kindergarten correctly predicted 85% of the total population with almost errorless prediction in the extreme reading groups (i.e., Severe and Superior). Furthermore, step-wise regression analyses revealed that the most discriminating tests represented measures of those skills postulated to be in primary ascendancy during pre-school.

The purpose of the present study is to determine whether the results of the second year follow-up can be replicated during the third year (end of Grade 2) at which time more objective criterion reading measures are available. Replication at this level would provide evidence for the early and valid 'warning system' before the child begins formal reading—at a time when his central nervous system may be more plastic and responsive to change—and at a time when he is less subject to the shattering effects of repeated academic failure.

Method

Subjects

The original population consisted of 497 white male kindergarten pupils in the Alachua County, Florida public school system and the University of Florida laboratory school. This figure represented virtually all of the white male population (96%) enrolled in the 20 schools (14 urban, 6 rural) at the time of testing (1970). Data were collected on 86 school days between October and March. The subjects were tested individually in an 8′ x 35′ trailer, equipped with four testing modules, which was transported to the grounds of each school.

The follow-up prediction analyses reported in this study (3 years) are based on these original kindergarten subjects for whom third year (Grade 2) criterion measures were available in 1973. Four hundred and fifty-eight children (92%) were available for the first criterion analysis and 419 (85%) were available for the second criterion analysis (see Criterion Variables).

Predictor Variables

Nineteen variables derived from the kindergarten standardization battery were utilized in the following analyses. A detailed description of each variable has been reported elsewhere (Satz and Friel 1973). They consist of (1) *Day of*

Testing [DT], (2) *Age*, (3) *Handedness* [Hand], (4) *Finger Tapping Total* [FT_T], (5) *Peabody Picture Vocabulary Test*, IQ Score [PPVT], (6) *Recognition-Discrimination* [R-D], (7) *Embedded Figures* [EF], (8) *Verbal Fluency* [VF], (9) *Developmental Test of Visual-Motor Integration* [Beery], (10) *WISC Similarities Subtest* [Sim.], (11) *Alphabet Recitation* [Alph.], (12) *Right-Left Discrimination* [R-L], (13) *Finger Localization* [FL], (14) *Auditory-Discrimination* [A-D], (15) *Dichotic Listening, Right Channel Recall* [DL_{RC}], (16) *Dichotic Listening, Left Channel Recall* [DL_{LC}], (17) *Auditory-Visual Integration* [A-V], (18) *Behavioral Checklist* [BCL], and (19) *Socioeconomic Status* [S-E].[3]

Criterion Variables

Two criterion measures were obtained for each subject during the late spring of year 3 (second grade in most cases). The first consisted of the teacher's assessment of reading ability based upon a ten-item reading level scale (Classroom Reading Level). The scale ranged from No Readiness (Score = 0) to Advanced Third Reader (Score = 9). The second measure, individually administered to each subject by the research staff, was the IOTA Word Test from the Monroe Diagnostic Reading Examination. This test consists of 53 words, most of which are purely phonetic and not taken from standard school texts, to be read aloud by the child. Norms extend up to the 5.5 grade level. These two measures provided the basis for the following two final criterion groupings utilized in the analyses.

Criterion A

Classroom Reading Level. This criterion measurement, which was obtained for 458 of the original 497 subjects (92%) both within and outside of Alachua County, was used to assign the pupils into four dichotomous reading groups. Subjects whose reading was assessed at Levels 0–4 (No Readiness through Primer) were designated as the *Severely Disabled* readers. Those assigned Level 5 (First Reader) comprised the *Mildly Disabled* reading group.

[3] The Satz and Friel (1973) article describes three additional variables (Finger Tapping Difference, Dichotic Listening Test [Ear Asymmetry] and Dichotic Listening Test [Total Recall]) which were subsequently eliminated because of redundancy. That is, they were shown to be linearly dependent on other items in the pool.

Subjects reading at Levels 6 and 7 (Second Readers) were designated *Average* readers, and those reading above that level comprised the *Superior* reading group.

Criterion B

Combined Reading Tests. The second criterion group assignment was based on reading scores derived from Classroom Reading Level and the IOTA. This combined reading criterion afforded the advantage of incorporating both the teacher's assessment of reading, based on nearly a year's interaction with the child, and an independent, individually administered, objective reading test. Both of these measures were obtained for a total of 419 of the original subjects (85%). (Fewer subjects were included in this combined criterion than the Classroom Reading Level group since the IOTA was administered to only those individuals who still resided in Florida or Georgia at the end of Grade 2, whereas the teacher questionnaires were distributed throughout the United States.)

The procedure used for deriving this combined measure was to convert both the Classroom Reading Level assignments and the IOTA raw scores to T-scores, with means set at 50 and standard deviations at 10 points. The T-scores on each measure were then averaged for each subject. The resulting distribution was then divided such that individuals whose averaged scores were more than one s.d. below the mean comprised the *Severely Disabled* readers. At the other extreme, subjects whose averaged scores exceeded one standard deviation (s.d.) above the means were designated the *Superior* reading group. Intermediate combined scores were divided such that those ranging from −1.0 s.d. to −0.4 s.d. comprised the *Mildly Disabled* reading group, and those which fell between −0.4 s.d. and +1.0 s.d. were designated *Average*.

Results

I. *Predictive Accuracy of Tests* against *Classroom Reading Level*

The following analyses were based on the predictive accuracy of the total test battery (n = 19) given at the beginning of kindergarten (1970) to the criterion of Classroom Reading Level which was independently assessed at the end of Grade 2 (1973). Before comparing the test battery with reading

Table 1

Predictive Classification of Children into Criterion Reading Groups (1973)[a] Based on Discriminant Function Composite Scores (1970).

Composite Test Scores[b]		Criterion Groups			
		Severe	*Mild*	*Average*	*Superior*
+	N	48	47	74	4
	%	(89)	(71)	(27)	(6)
−	N	6	19	196	64
	%	(11)	(29)	(73)	(94)
	T	54	66	270	68

[a]Criterion = Classroom Reading Level (N_T = 458).

[b]Program = DSCRIM, Multiple Discriminant Analysis (4 group predictions collapsed), prior probabilities set equal.

criterion, an analysis was first computed on the distribution of reading scores at the end of Grade 2. The frequencies in each of the four criterion groups (*Severe, Mild, Average* and *Superior*) can be seen in the column totals of Table 1. This dichotomized distribution reveals an over-all incidence of 26% for reading disability in the present population [(54 + 66)/458] and an incidence of 12% for severe reading disability (54/458).

A modified four-group discriminant function analysis (Program DSCRIM) was then computed.[4] The results of this analysis (Table 1) can be

[4]Written by D. J. Veldman, University of Texas, 1967; modified by author (R. A. G.). Statistical analyses performed on IBM System/370/165, Northeast Regional Data Center, Gainesville, Florida.

seen by comparing the test predictions (+,−) in the rows (1970) against the criterion outcomes in the columns (1973). For valid positives, the tests correctly predicted 48 of the 54 *Severe* cases (V_p = 89%) and 47 of the 66 *Mild* cases (V_p = 71%). For valid negatives, the tests correctly predicted 196 of the 270 *Average* readers (V_n = 73%) and 64 of the 68 *Superior* readers (V_n = 94%). In other words, the predictive accuracy was largely confined to the extreme reading groups, with overlap error largely confined to the *Mildly Disabled* and *Average* reading groups. In terms of overall hit-rate, the tests correctly predicted 355 (48 + 47 + 196 + 64) of the 458 subjects or 78% of the standardization population.

II. *Predictive Ranking of Tests* against *Classroom Reading Level*

The purpose of this analysis was to determine the ranking of the predictor variables in terms of their criterion discrimination. Table 2 presents

Table 2

Discriminative Ranking and Cumulative Classification of Tests by Factor Loading based on Stepwise Discriminant Function Composite Scores[a,b]

Ranked Variables	*Factor*	*Cumulative % Correct*
1. Finger Localization	I	70.5
2. Alphabet Recitation	I	75.5
3. Recognition-Discrimination	I	77.3
4. Day of Testing	I	76.9
5. Residual Tests	I-IV	77.7

[a]Criterion = Classroom Reading Level
[b]Program = BMD07M, Stepwise Discriminant Analysis (4 group), prior probabilities set equal.

the ranking of the most accurate tests along with their cumulative hit frequencies and factorial loadings. Inspection of this table reveals that *Finger Localization* ranked highest (71%) followed cumulatively by *Alphabet Recitation* (76%), *Recognition-Discrimination* (77%) and *Day of Testing* (77%). The remaining tests contributed an additional increment of less than one percent to the total hit-rate of 78%.

Table 2 also shows that each of the preceding four tests loaded on Factor I, which has previously been defined as a general measure of sensori-perceptual-motor-mnemonic ability (Satz and Friel 1973). Factor I is felt to tap those skills which are in primary ascendancy during preschool years (i.e., kindergarten).

III. *Predictive Accuracy of Tests* against *Classroom Reading Level* and *IOTA Word Recognition*

The following analyses were based on the predictive accuracy of the total test battery (n = 19) given at the beginning of kindergarten (1970) to the *combined* criterion of Classroom Reading Level plus word recognition assessed via the IOTA at the end of Grade 2 in 1973. An analysis of the distribution of scores for this combined criterion revealed the frequencies for the four separate criterion groups shown in the column totals of Table 3. Inspection of this table reveals a higher incidence of reading disability for the combined criteria (*Overall* = 34% (67 + 77)/419]; *Severe* = 16% 67/419) although based on a smaller total number of *Ss*.[5]

A modified four group discriminant function analysis (Program DSCRIM) was then computed. The results of this analysis (Table 3) can be seen by comparing the test predictions (+,−) in the rows (1970) against the criterion outcomes in the columns (1973).

For valid positives, the tests correctly predicted 61 of the 67 *Severe* cases (V_p = 91%) and 51 of the 77 *Mild* cases (V_p = 66%). For valid negatives, the test correctly predicted 146 of the 214 *Average* readers (V_n = 68%) and 59 of the 61 *Superior* readers (V_n = 97%). This classification again shows that the predictive accuracy was largely confined to the extreme reading groups;

[5] The overall incidence of 34% for reading disability, using this more refined composite reading criterion, is approximately what would be expected for a male population. If the national incidence is approximately 20% with a sex ratio of 4:1 in favor of boys, then the incidence should increase to 32% in a male population.

Table 3

Predictive Classification of Children into Criterion Reading Groups (1973)[a] based on Discriminant Function composite Scores (1970).

Composite Test Scores[b]	Criterion Groups			
	Severe	*Mild*	*Average*	*Superior*
N	61	51	68	2
+				
%	(91)	(66)	(32)	(3)
N	6	26	146	59
-				
%	(9)	(34)	(68)	(97)
T	67	77	214	61

[a]Criterion = Classroom Reading Level + IOTA Word Recognition (N = 419)

[b]Program = DSCRIM, Multiple Discriminant Analysis (4 group predictions collapsed), prior probabilities set equal.

consequently, the prediction error was virtually confined to the *Mildly Disabled* and *Average* reading groups. In terms of overall hit rate, the tests correctly predicted 317 (61 + 51 + 146 + [illegible]) of the 419 subjects or 76% of the total sample.

IV. *Predictive Ranking of Tests* against *Combined Reading Criterion*

A step-wise regression analysis was computed to determine the predictive ranking of the tests (1970) against the new and more refined composite reading criterion (i.e., Classroom Reading Level and IOTA Word Recogni-

Table 4

Discriminative Ranking and Cumulative Classification of Tests by Factor Loadings based on Discriminant Function Composite Score[a,b]

Ranked Variables	Factor	Cumulative % Correct
1. Finger Localization	I	70.9
2. Alphabet Recitation	I	74.9
3. Recognition-Discrimination	I	76.4
4. Day of Testing	I	76.1
5. Residual Tests	I-IV	77.1

[a]Criterion = Classroom Reading Level and IOTA Word Recognition

[b]Program = BMD07M, Stepwise Discriminant Analysis (4 group), prior probabilities set equal.

tion). The results of this analysis are presented in Table 4 and show that *Finger Localization* ranked highest (71%) followed cumulatively by *Alphabet Recitation* (75%), *Recognition-Discrimination* (76%) and *Day of Testing* (76%). The remaining tests contributed an additional increment of only one percent to the total hit-rate of 77%.[6] The four top-ranking variables are identical to those in the comparable Classroom Reading Level analysis (Table 2), each of which loaded on Factor I, a general measure of sensori-perceptual-motor-mnemonic ability (Satz and Friel 1973).

[6]The slight discrepancy in total hit-rate between DSCRIM and BMDO7M is believed to reflect computational differences between the two programs.

V. *Predictive Accuracy of Abbreviated Battery* against *Combined Reading Criterion*

Because of the high predictive accuracy demonstrated by a limited number of tests in each of the preceding step-wise regression analyses (Tables 2 and 4), an analysis was made to determine whether an abbreviated set of variables might be substituted for the total test battery. The procedure for selection of the abbreviated battery was based on an empirical evaluation of those test variables which uniformly ranked highest in each of the yearly test-criterion discriminant function analyses, including the present (Satz and Friel 1973; Satz and Friel 1974; Satz, and Friel and Rudegeair 1974). Based on this empirical evaluation, eight variables (seven test and one non-test variables) were finally selected and an additional discriminant function analysis (Program DSCRIM) was computed.[7]

The results of this analysis (Table 5) can be seen by comparing the test predictions (+,−) in the rows (1970) against the criterion outcomes in the columns (1973). For valid positives, the tests correctly predicted 58 of the 67 *Severe* cases (V_p = 87%) and 50 of the 77 *Mild* cases (V_p = 65%). For valid negatives, the tests correctly predicted 153 of the 214 *Average* readers (V_n = 71%) and 60 of the 61 *Superior* readers (V_n = 98%). As in previous analyses, the prediction errors were largely confined to the *Mildly Disabled* and *Average* reading groups, not to the extreme groups. In terms of overall hit-rate, the abbreviated test battery correctly predicted 321 (58 + 50 + 153 + 60) of the 419 subjects or 77% of the sample.

VI. *Predictive Utility of Tests* against *Combined Reading Criterion*

The purpose of the following analysis was to determine whether the differential test signs assessed in kindergarten (1970) would have any predictive validation in terms of *decisions* to initiate treatment (T) or to withold treatment (NT). The need for this type of analysis was evident from the accuracy of the tests in the extreme reading groups (i.e., *Severe* and *Superior*)

[7] The abbreviated battery comprised the following: (1) Peabody Picture Vocabulary Test, (2) Recognition-Discrimination Test, (3) Beery Developmental Test of Visual-Motor Integration, (4) Alphabet Recitation Test, (5) Finger Localization Test, (6) Auditory-Discrimination Test, (7) Dichotic Listening Test (Total Recall) and (8) Socio-economic status.

Table 5

Predictive Classification of Children into Criterion Reading Groups (1973)[a] based on Abbreviated Battery

Composite Test Scores[b]	Criterion Groups			
	Severe	*Mild*	*Average*	*Superior*
+ N	58	50	61	1
+ %	(87)	(65)	(29)	(2)
− N	9	27	153	60
− %	(13)	(35)	(71)	(98)
T	67	77	214	61

[a]Criterion = Classroom Reading Level + IOTA Word Recognition (N_T = 419)

[b]Program = DSCRIM, Multiple Discriminant Analysis (4 group predictions collapsed), prior probabilities set equal.

in each of the preceding discriminant function analyses (Tables 1, 3, and 5). To compute the conditional probabilities for each of the test signs and decisions, the (+) and (−) rows in Table 3 have been subdivided (on the basis of the original four group DSCRIM analysis) to generate four levels of test decisions. Table 6 reveals this 4 x 4 contingency table in which the test decisions are represented by rows and the outcomes are represented by columns. If the decision to treat (T) is based on test positives [++] or [+] (rows 1 and 2) and the decision to withhold treatment (NT) is based on test negatives [− or − −] (rows 3 and 4) then one could determine the conditional probability of being correct for each of the two types of treatment decisions. This conditional probability value merely reflects the inverse probabilities of

the test signs (valid and false positives) and the base rates of reading competency in this population (Meehl and Rosen, 1955).

Inspection of Table 6 shows that the decision to treat (T) or not to treat (NT) would be correct largely on the basis of the composite test score which the child revealed during kindergarten. Given a [+ +] composite test score, the decision to *initiate treatment* would have been correct in 82% of the cases and would have included 50 of the 67 potential *Severe* cases (75%) and *none* of the potential *Superior* cases. The only decision risk (false positive) would involve those 15 cases which, without treatment, would have become *Average* readers.

By contrast, the decision to initiate treatment, given a [+] composite score, would have been correct only 44% of the time. In other words, extension of treatment services to this group would have yielded only 11 more of the potential *Severe* cases and 33 of the potential *Mild* cases, but it

Table 6

Probability of Decision Risk (Treatment/No Treatment) associated with Differential Composite Test Score Predictions to Third Year Reading Level[a]

Composite Test Scores[b]		Criterion Groups					
	Decision	*Severe*	*Mild*	*Average*	*Superior*	*Ratio Correct*	*P*
+ +	T	50	18	15	0	68/83	.82
+	T	11	33	53	2	44/99	.44
-	NT	5	23	84	11	95/123	.77
- -	NT	1	3	62	48	110/114	.96
	Total	67	77	214	61		

[a]Criterion = Classroom Reading Level + IOTA Word Recognition (N_T = 419).
[b]Program = DSCRIM, Multiple Discriminant Analysis (4 group), prior probabilities set equal.

would also have involved treatment for 55 children who would not have needed it (false positives). Thus, initiation of treatment for this composite test sign (+) would have resulted in treating more children who didn't need it than did.

Table 6 also shows that the decision to withhold treatment (NT) would have been correct 77% of the time given a [−] composite test score, and 96% of the time given a [− −] composite test score. The only risk, given a mild low risk sign (−) is that treatment would have been withheld for a small number of potentially *Severe* (N=5) and *Mild* (N=23) reading cases. This decision risk, however, would have been virtually eliminated by adopting a more conservative no treatment policy based on very low risk signs (− −).

Discussion

The present results provide continued support for the validity of the tests given in 1970, at the beginning of kindergarten, to forecast reading achievement levels at the end of Grade 2 (1973). Of particular interest is the fact that these predictive measures assessed a variety of developmental and neuropsychological skills other than reading *per se*—and at a time *before* formal reading instruction commenced.

The results showed that the tests were highly predictive of later reading level, particularly in the extreme reading groups (*Severe* and *Superior*), despite an interval span of nearly three years during which a host of uncontrolled environmental, growth and intervention factors intervened.[8] In fact, the predictive accuracy of the battery revealed only minimal shrinkage between the second (Grade 1, 1972) and third follow-up years (Grade 2, 1973). The overall hit-rate for the two year follow-up (see Satz and Friel 1974) was 84.4% which was only slightly higher than the current results (H_T = 78% and 77%, respectively).[9] More important, however, is the predictive accuracy in the extreme reading groups. Both studies have continued to reveal almost errorless prediction in the detection of potential *Superior* readers and *Severely Disabled* readers, regardless whether classroom reading measures

[8] No feedback information on test results were given to the schools during this test-criterion interval.

[9] A higher overall hit-rate was obtained in the two year follow-up when an adjusted cutting line was employed (91%). However, the present comparisons are based on standard computer-generated cutting lines.

were employed, either in Grades 1 or 2, whether objective word recognition tests were employed, or both. In either case, the test battery was extremely predictive of those children who in later years were destined to extremes in the distribution of reading competency. It is these extreme criterion groups that educators particularly wish to detect. In the case of the present combined reading criterion (Classroom Reading and IOTA), the tests given in 1970 detected 61 of the 67 *Severely Disabled* readers (91%) and 59 of the 61 *Superior* readers (97%) three years later. In other words, most of the prediction error was confined to the *Mildly Disabled* and *Average* reading groups; almost identical results were found in the previous two-year follow-up (Satz and Friel, in press). These error types, however, are felt to be more academic than risky in that virtually *no* child who was predicted to be *Severe* [+ +] in kindergarten (1970) fell in the *Superior* reading group at the end of Grade 2 (1973). Conversely, only one child who was predicted to be a *Superior* reader [− −] in kindergarten (1970) fell in the *Severely Disabled* reading group at the end of Grade 2 (1973).

These results, which can be more easily visualized from Table 6, minimize the risk of both false positive and false negative prediction errors. They, in turn, provide some encouragement for the utility of early intervention programs based on these differential early detection signs. It was shown (Table 6) that the composite detection signs could be utilized by educators to decide on whether an intervention program should be instituted (T) or withheld (NT) for a given child. If an educator decided to adopt a conservative strategy (T), i.e., to intervene only in cases of *Severe* high risk test signs [+ +], then he could be assured that his *preventive* intervention efforts would, in the vast majority of cases, be given to potentially high risk children (82%); furthermore, this decision strategy would virtually exclude the risk (false positive) of intervening on a potentially low risk *Superior* reader three years hence.

If the educator adopted a similar conservative strategy to withhold treatment (NT), given an extreme low risk test sign [− −], he could likewise be assured that this decision would be correct 96% of the time; in fact, this prevention strategy would have missed only one potentially *Severe* high risk child.

The utility outcomes in Table 6 revealed that the only decision risk concerned the strategy to extend the intervention programs to both severe and mild high risk test signs [+ + and +]. To institute a preventive remediation program, based on both types of positive test signs, would have detected

many children who would have turned out in later years not to need such help. These false positive cases, however, would have included almost exclusively *Average* readers and not *Superior* readers. Therefore, the ultimate risk with this more liberal intervention strategy [+ + and +] would essentially be economical rather than error. These considerations, in brief, highlight some of the advantages of a utility table based on differential test signs and criterion outcomes. It provides educators with the opportunity to consider different strategies for both intervention (T) and non-intervention (NT) and the risk factors (error and cost) associated with each decision. Within a prevention context, these utility considerations become of crucial importance.

Utility considerations were also evident on the detection side. The fact that the abbreviated battery (n = 9) detected virtually the same number of cases within each criterion reading group, despite an interval span of nearly three years, greatly increases the cost and time efficiency of this instrument. It suggests that "early screening" procedures could be applied to larger groups of children at no additional cost; furthermore, the form is less complicated to administer and score—hence its potential usefulness for individual teacher administration.

The only caution which still remains concerns the ability of these tests to predict the third year reading outcomes on an additional group of male children (N = 200) who were originally tested in kindergarten in 1971. This independent group of children (1974) will comprise the final cross-validation based on the discriminant weights derived from the current three year standardization follow-up (1973). The results of this cross-validation analysis are now being computed on both the standard and abbreviated test batteries.

The high predictive validity *and* utility of the kindergarten measures represents a necessary but not sufficient demonstration of the early precursors of reading disability postulated in the theory (Satz et al. 1970, 1971, 1973). An evaluation of this problem depends, in part, on the results of the step-wise discriminant analyses for each of the reading criteria. The results (Tables 2 and 4) revealed an identical ranking for both Classroom Reading Level (Criterion A) and for Classroom Reading Level and IOTA (Criterion B). *Finger Localization* ranked highest followed by *Alphabet Recitation, Recognition-Discrimination* and *Day of Testing.* These are exactly the same variables that ranked highest in the previous two year follow-up study to end of Grade 1 reading (Satz and Friel 1974). They also represent the same tests that best discriminated a composite reading criterion based on Class-

room Reading Level, IOTA and Gates Vocabulary recognition in a separate three year follow-up (Satz, Friel and Rudegeair 1974).

The distinguishing feature of these variables is that each has been shown to load on Factor I (Tables 2 and 4). This factor has previously been defined as a general measure of sensori-perceptual-motor-mnemonic ability (Satz and Friel 1973).[10] As such it represents those skills which are postulated to be in primary ascendancy during pre-school and which are postulated to be crucial to the early phases of reading (Gibson 1968; Luria 1966). It is interesting to note that a similar factor was recently found in a kindergarten sample with the deHirsch predictive battery (Adkins, Holmes and Schnackenberg 1971). Although the de Hirsch battery also assesses a wide range of cognitive, perceptual and language skills, only one factor emerged (visual-discriminative) for children ages 5–6 (Adkins et al. 1971).[11] One might also recall that in the original de Hirsch, Jansky and Langford longitudinal study (1966), one of the most predictive measures of later reading disability was a test of perceptual motor integration. Similar findings were reported in a three-year follow-up of disadvantaged first graders (Weiner and Wepman 1971). The authors found that measures of perceptual and perceptual-motor functioning during first grade were extremely sensitive predictors of school achievement (largely language) at the end of third grade. It has also been shown (Chissom 1971) that skills which have a much earlier rate of development (e.g., balance and motor coordination) correlate with academic aptitude and achievement in younger boys (first grade) but not in older boys (third grade). These findings again highlight the potential usefulness of developmental concepts in at-

[10] Day of Testing, which loads on Factor I, is excluded from reference as a measure of ability or skill. In fact, it is difficult to explain the high ranking of this variable across years. One tentative explanation is that the score on this variable has been consistently higher in the disabled reading group which may reflect the fact that rural school children were tested in the later phases of the 1970 fall assessment. As such, it suggests that Day of Testing may be assessing an environmental and/or socio-economic factor. Indirect support for this hypothesis is seen in the relationship between low socio-economic status and the combined reading criterion (1973). Thirty-six percent of the Severe reading group were classified as low socio-economic status whereas none of the Superior reading group were so classified. This interpretation, if true, illustrates the relationship between early cultural deprivation and subsequent reading achievement for some children, but not the majority. Obviously other factors are involved.

[11] By contrast, four factors were identified with the present battery, only one of which proved to be sensitive to later reading achievement (i.e., Factor I).

tempts to isolate some of the predictive antecedents of later reading and learning disability.

The application of these concepts proved most instructive in a recent study, using the present longitudinal data (see Satz, Friel, and Rudegeair 1974). In Year 3 (Grade 2, 1973), all of the children were readministered the identical test battery given in Year 1 (kindergarten, 1970). On the basis of the composite reading scores from Grade 2 (N = 3), a group of Severely Disabled readers (N = 60) was individually and rigorously matched with a control group of Average-Superior readers (N = 60) and the developmental performances were then compared within subjects by age (K vs. G2) and between groups (disabled readers vs. control readers). A group X age interaction was observed for each of the three most predictive kindergarten tests (i.e., Finger Localization, Alphabet and Recognition-Discrimination). In other words, the lag or delay which the high risk children revealed on these measures during kindergarten were essentially overcome by the end of Grade 2 (1973). Yet, their reading problems persisted. These findings strongly suggest that those antecedent test signs that forecast later problems in reading may not be evident by the time the disorder is manifest. This would be particularly true if one postulates a delay mechanism which retards the acquisition of those earlier developing skills which are crucial to the beginning phases of reading.

In fact, Satz and associates (1970, 1971, 1973) have postulated that a lag mechanism exists in brain maturation which retards differentially the acquisition of developmental skills during childhood. Consequently, those skills which develop ontogenetically earlier (e.g., visual-perceptual and cross-modal integration) are more likely to be delayed in *younger* children who are maturationally immature. Conversely, those skills which have a later or slower rate of development (e.g., language and formal operations) are more likely to be delayed in *older* children who are maturationally immature. In other words, the theory postulates that the brain-lag mechanism (genetic or otherwise) merely retards the sequential and hierarchical stages of thought that mark the different age dependent periods in development (Bruner 1968; Piaget 1926). This position eschews a disease model and focuses on the rate at which the developmental milestones are reached.[12]

[12] The theory predicts, however, that if the developmental lag persists beyond puberty—at which time adult parameters of brain maturation are complete—then permanent behavioral sequelae may occur.

The results of the present third year test-criterion follow-up, however, do not permit an evaluation of the developmental changes which are postulated to occur in dyslexia over time. This evaluation can only be determined after the children are retested again on the original predictive measures in 1976 (end of Grade 5). The current results merely lend additional support for the validity and utility of these predictive measures—and indirectly for the theory which postulated the selection and discriminative ranking of these developmental precursors.

If the present results can be cross-validated on the additional group of children who recently completed Grade 2 in 1974, then some hope for a valid "early warning" system can be realized. This would provide educators with an opportunity to detect severely high risk children before the child begins formal reading—at a time when his central nervous system may be more plastic and responsive to change—and at a time when he is less subject to the shattering effects of repeated academic failure. This type of "early warning system" would also provide educators with an opportunity to detect those children who are destined to superior levels of reading achievement in three years. This state-of-affairs, clearly within a prevention context, could challenge the resources and imagination of our schools to more efficiently prepare the slow starter and stimulate the gifted child during the kindergarten years. To ignore this opportunity will only serve to magnify the problems that already exist.

References

Adkins, P. L., G. R. Holmes, and R. C. Schnackenberg. 1971. Factor analyses of the de Hirsch predictive index. *Percept. Motor Skills* 33:1319-1325.

Bruner, J. S. 1968. The course of cognitive growth. In N. S. Endler et al. (eds.). *Contemporary Issues in Developmental Psychology*. New York: Holt, Rinehart & Winston.

Chissom, B. A. 1971. A factor-analytic study of the relationship of motor factors to academic criteria for first- and third-grade boys. *Child Develop.* 42:1133-1143.

de Hirsch, K., J. Jansky, and W. S. Langford. 1966. *Predicting Reading Failure*. New York: Harper & Row.

Gibson, E. J. 1968. Learning to read. In N. S. Endler et al. (eds). *Contemporary Issues in Developmental Psychology*. New York: Holt, Rinehart & Winston.

Luria, A. R. 1966. *Higher Cortical Functions in Man*. New York: Basic Books.

Meehl, P. E. and A. Rosen. 1955. Antecedent probability and the efficiency of psychometric signs, patterns, or cutting scores. *Psychol. Bull.* 52:194-216.

Piaget, J. 1926. *Judgment and Reasoning in the Child*. New York: Harcourt & Brace.

Satz, P. and J. Friel. 1973. Some predictive antecedents of specific learning disability: A preliminary one-year follow-up. In P. Satz and J. Ross (eds.), *The Disabled Learner: Early Detection and Intervention*. Rotterdam: Rotterdam U. Press.

Satz, P. and J. Friel. 1974. Some predictive antecedents of specific reading disability: A preliminary two-year follow-up. *J. Learning Disabilities* 7:437-444.

Satz, P., J. Friel, and F. Rudegeair. 1974. Differential changes in the acquisition of developmental skills in children who later become dyslexic: Three-year follow-up. In D. Stein and N. Butters (eds.) *Plasticity and Recovery of Function in the Central Nervous System.* New York: Academic Press.

Satz, P., D. Rardin, and J. Ross. 1971. An evaluation of a theory of specific developmental dyslexia. *Child Develop.* 42:2009-2021.

Satz, P. and S. Sparrow. 1970. Specific developmental dyslexia: A theoretical formulation. In D. J. Bakker and P. Satz (eds.). *Specific Reading Disability: Advances in Theory and Method.* Rotterdam: Rotterdam U. Press.

Satz, P. and G. K, Van Nostrand. 1973. Developmental dyslexia: An evaluation of a theory. In P. Satz and J. Ross (eds). *The Disabled Learner: Early Detection and Intervention.* Rotterdam: Rotterdam U. Press.

Weiner, P. S. and J. M. Wepman. 1971. The relationship of early perceptual level functioning to later school achievements in black disadvantaged child. Div. Res. Demonstr. Grants., SRS, Dept. of HEW. Washington, D. C.

Dichotic Listening with Related Tasks for Dyslexics— Differential Use of Strategies

C. K. Leong

Associate Professor, Institute of Child Guidance and Development, University of Saskatchewan, Saskatoon, Saskatchewan, Canada.

Since the pioneering works of Cherry (1953), Cherry and Taylor (1954), and Broadbent (1954) dichotic listening experiments* progressively refined have been conducted on different groups with different research hypotheses and have generated findings relating to memorial and perceptual processes. Dichotic listening has been studied in relation to normal and pathological brain functions (Kimura 1961a, 1961b; Milner, Taylor, and Sperry 1968; Schulhoff and Goodglass 1969); lateralized brain damage in early childhood (Goodglass 1967); stuttering (Curry and Gregory 1969); handedness (Curry 1967; Curry and Rutherford 1967; Dee 1971; Knox and Boone 1970; Orlando 1972; Satz 1968; Satz, Achenbach, Pattishall, and Fennell 1965; Zurif and Bryden 1969; Zurif and Carson 1970); selective listening ability and developmental trend (Inglis and Caird 1963; Maccoby 1967; Maccoby and Konrad 1966, 1967; Treisman and Geffen 1967; Treisman and Riley 1969); and very recently speech lateralization and overt motor (hand) activity (Kimura 1973a, 1973b, 1973c). Different groups of exceptional children have been investigated in their perceptual and memorial processes via dichotic listening tasks: mentally retarded children (Jones and Spreen 1967; Neufeldt 1966); hearing impaired children (Ling 1971); high and low achievers (Conners, Kramer, and Guerra 1969) and disabled readers (Zurif and Carson 1970).

The present dichotic study was part of a larger investigation predicated

---

This paper was presented at the World Congress on Dyslexia, Rochester, Minnesota, November 1974.

*A dichotic listening procedure is one in which stimuli are presented through earphones to the subject's two ears independently for listening and response according to the conditions of the experiment.—Ed.

on the postulate of functional cerebral development (Semmes 1968; Semmes, Weinstein, Ghent, and Teuber 1960). Semmes and associates suggest that the cerebral lateralization of speech stems from lateralization of less complex motor and somatosensory functions which precede the lateralization of language. Semmes (1968) argues convincingly that each of these hierarchical functions is more focally represented within the left cerebral hemisphere and more diffusely organized in the right hemisphere in man. The focal representation of elementary functions in the left hemisphere favors integration of similar units and consequently specialization for behaviors which demand fine sensori-motor control, such as manual skills and speech. Conversely, diffuse representation of elementary functions in the right hemisphere may lead to integration of dissimilar units and hence specialization for behaviors requiring multi-modal coordination such as various spatial abilities. This hierarchical development and integration of complex functions also provides the theoretical underpinning of the maturational lag postulate of Bakker and Satz (Bakker and Satz 1970; Satz and Ross 1973) in their work with disabled readers.

Arising from the postulate of maturational lag of the left hemisphere and the corresponding lag in the functional specialization of language in dyslexics, there could be two lines of thought. One is that the deficits of these children should be confined mainly to verbal materials and that their performance in visual-motor and other tasks of a "non-reading" nature should be largely unaffected (Symmes 1972; Symmes and Rapoport 1972). The other line of thought is that the whole matrix of spatial-temporal integration is impaired (Doehring 1968) and that there is a general deficit in auditory sequential processing of verbally codifiable materials (Bakker 1972; Bakker and Satz 1970; Doehring and Rabinovitch 1969). Available evidence seems to offer stronger support for the second line of thought. Pursuing this further, the present dichotic study aimed at delineating the nature of the auditory sequential deficit. An earlier related dichotic digit experiment (DLI) reported elsewhere demonstrates that a group of disabled readers performs significantly worse in the overall right-ear superiority when compared with an equivalent group of above-average readers equated for age, sex and general ability. This differential performance is taken as prima facie evidence of a lag in functional cerebral development of dyslexics. This explanation of slightly poorer right-ear performance without implying that disabled readers have better left-ear scores or that readers with better left-ear performance are

necessarily at risk is consonant with the cerebral maturational lag hypothesis (Bakker 1973; Satz and Sparrow 1970). Specifically, the present study aimed at determining if these disabled readers would be as efficient as their controls in reporting dichotic materials by using pre-instructed strategies. The differential use of strategies would be reflected in the greater disparity between *sides* (left and right ears) and *types* (digits and letters of the alphabet) for dichotic scores.

Dichotic Listening Experiments

Subjects

The subjects for the study consisted of an Experimental Group (Group EX) of 58 dyslexic children compared with a Control Group (Group CO) of an equal number of non-disabled readers equated on age, sex, and general ability. The Experimental Group comprised a total of 58 boys in resource rooms in 16 different schools in a Western Canadian city. Chronological ages (CA) ranged from 8 years 7 months (8–7) to 10 years 1 month (10–1) as of 1st October 1973 when the study commenced. These boys had all been diagnosed as "retarded" in reading by two and a half grades or more, but were otherwise of average intelligence and free from gross emotional, visual and auditory disabilities. The children were further screened for normal hearing (25 dB± ISO, 0.25 K to 8 K Hz). Controls consisting of 58 above-average readers were selected by the teachers from the same 16 schools in such a way that these children were equated on age (8–7 to 10–1 on 1st October 1973), sex (all boys) and general ability level (average) to the disabled readers. Also, there was the same number of above-average (in reading) boys in the Control Group as there were dyslexics in the Experimental Group in each of the 16 schools (3 to 5 boys in each group/school).

In equating the Experimental Group and the Control Group it was decided for a number of reasons to use results of tests given within the immediately preceding six months rather than to add to the heavy experimental schedule with further tests. For the Experimental Group reading performance on the Neale Reading Analysis averaged 7 years 2 months (mean Neale Accuracy of 85.75 months with a standard deviation of 5.7 months and mean Neale Comprehension of 85.17 months with a standard deviation of

5.62 months) and performance on the Schonell Word Recognition Test, which has been shown to be more stringent and less susceptible to practice effect, averaged at the grade 1.3 level. For the Control Group reading performance on the Gates-MacGinitie averaged at the 75th percentile. On ability levels, the procedure used by Doehring (1968) and Satz and associates (Satz and Nostrand 1973; Sparrow and Satz 1970) was followed. By using only the Wechsler Intelligence Scale for Children (WISC) Performance IQ (given within 6 months of testing) to gauge equivalence any verbal bias against the disabled readers is circumvented. The children in both groups were further administered the same Lorge-Thorndike Non-Verbal Test Level III by the present writer to ensure greater comparability of the two groups.

A summary of the sample characteristics in respect of age and general ability level of the two groups is shown in Table 1. These characteristics are represented graphically in the histograms of Figure 1 and Figure 2. The difference in chronological age and IQ between the two groups was not significant as shown in both univariate analysis and multivariate Hotelling T^2 involving other tasks in the larger investigation.

Table 1.

Table 1 Means (M) and Standard Deviations (SD) of Age and Ability Level (IQ) of Experimental and Control Groups (N=58 Boys in Each Group)

		CA (in Months)*	IQ	
Group			WISC PIQ	Lorge-Thorndike Non-Verbal IQ
Experimental	M	111.069	105.086	102.448
(EX)	SD	4.781	12.559	11.495
Control	M	110.931		107.569
(CO)	SD	5.014		10.934

*As in October, 1973

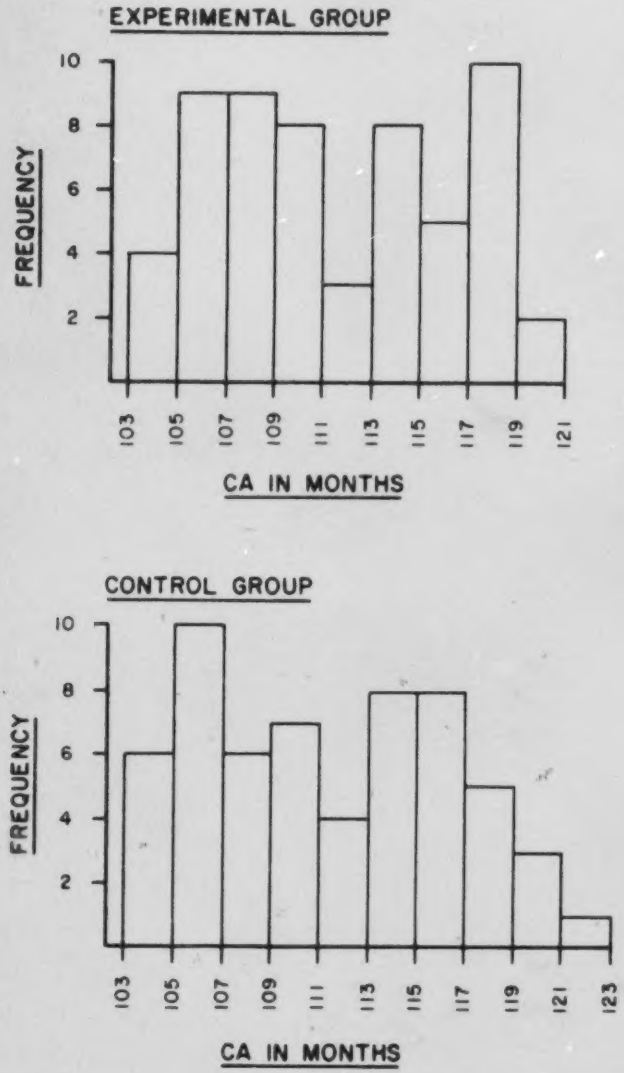


Figure 1. Histograms showing distribution of chronological ages (CA) in months of two groups.

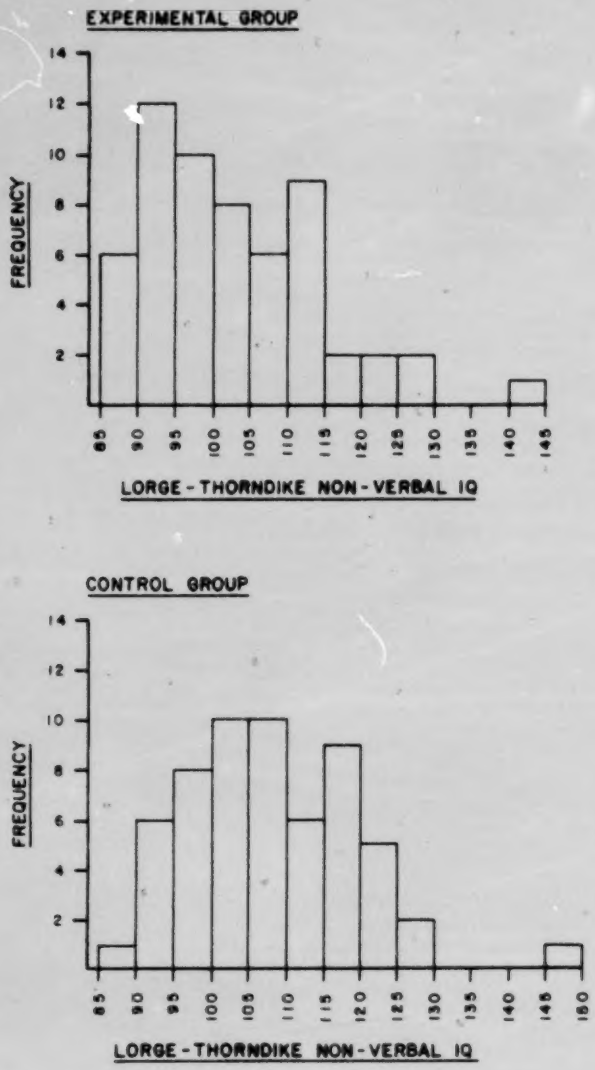


Figure 2. Histogram showing distribution of ability (Lorge-Thorndike Non-Verbal IQ, Level III, Form A) for two groups.

Materials

Two dichotic listening experiments using digits and letters of the alphabet were conducted. In Dichotic Experiment 2 (DL2) a list of 12 series of 3-element pairs consisting of a combination of 3 digits and 3 letters of the alphabet (e.g. $\frac{9\text{-m-x}}{y\text{-}2\text{-}7}$) was used as suggested by Neufeldt (1966). The digits ranged from 0 (pronounced zero) to 9 while only 10 letters of the alphabet (A, E, I, O, U, Y, L, M, R, X) were selected to minimize acoustic confusability (except perhaps for I and Y). The tape was prepared with a system of instrumentation devised by the present writer[1] with the innovative use of the Hewlett-Packard 760 polygraph machine to gauge both onset synchrony of individual pairs of stimuli and inter-stimulus interval (ISI). The rate of presentation or ISI was 2-element (digit/letters) pair per second and onset synchrony of the stimuli differed by an average of 5 msec. as verified from polygraph tracings. The total tape run of the 12 dichotic series including practice examples but excluding instructions was 3 minutes 57 seconds at 7 1/2 tape speed. In DL2 the child was instructed to report all the elements heard in one ear first and then those elements heard in the other ear (report by *sides*). For Dichotic Experiment 3 (DL3) a list similar to that of DL2 was used and tape preparation followed the same procedure with a total tape run of 3 minutes 28 seconds. The child was instructed to report either all the numbers first, or all the letters first irrespective of half-spans (ears). This is the report by *types* strategy.

Procedure

In both experiments the "yoked" design or counter-balanced design was used in each school. In other words, in DL2 half of the children in each school would report all the stimuli (digits and letters of the alphabet) heard in one ear (left or right) first and then those heard in the other ear, order of testing being randomized. In DL3 half of the children in each school would report either the digits first, then the letters of the alphabet, and the other half the letters before the digits, order of testing being again randomised. All playback was via a Sony 777-4J at a comfortable hearing level.

[1] The writer is indebted to Dr. Burchard M. Carr, Director of the Department of Speech Pathology at Oklahoma State University, for extended discussion of dichotic tape preparation and suggestion of ideas.

As specific instructions of reporting were given and as only three elements were involved in each half-span, the main scoring method was that of *serial* scoring. This takes into account the correct serial position of the stimuli. This is illustrated with the response of u-(6)-9-y-8-DK to $\frac{L/R\ u\text{-}m\text{-}l}{R/L\ 9\text{-}6\text{-}8}$ when the specific instruction is to report all the digits first then letters of the alphabet. Here the total score for serial scoring is 1 as "6" is the only *serially* correct element in the proper *serial* position according to the pre-instructed strategy, while "6-9" or "8" followed by "don't know (DK)" are not in their correct positions. A variation of the serial scoring is the *free* scoring method which takes into account all correct elements irrespective of the sides or the types strategy or serial positions. The same response (u)-(6)-(9)-y-(8)-DK to $\frac{L/R\ u\text{-}m\text{-}l}{R/L\ 9\text{-}6\text{-}8}$ would give a total free score of 4.

Results and Discussion

Mean scores for each of the strategies of recall by sides (ears) and by types (digits and letters) for both serial and free scoring for the Experimental Group and the Control Group are shown in Table 2. This information is shown in the histograms in Figure 3.

For the more stringent serial scoring it is interesting to note that disabled readers seem not to be able to use differential strategies as shown by the

Table 2
Means (M) and Standard Deviations (SD) for Two Groups (N=58 in each Group) as a Function of Strategies for Two Methods of Scoring

Group		Serial Scoring		Free Scoring	
		Sides	Types	Sides	Types
Experimental	M	24.84	24.93	36.24	35.12
(EX)	SD	8.86	6.78	6.96	6.76
Control	M	34.91	38.21	43.88	44.17
(CO)	SD	10.16	7.87	7.87	6.76

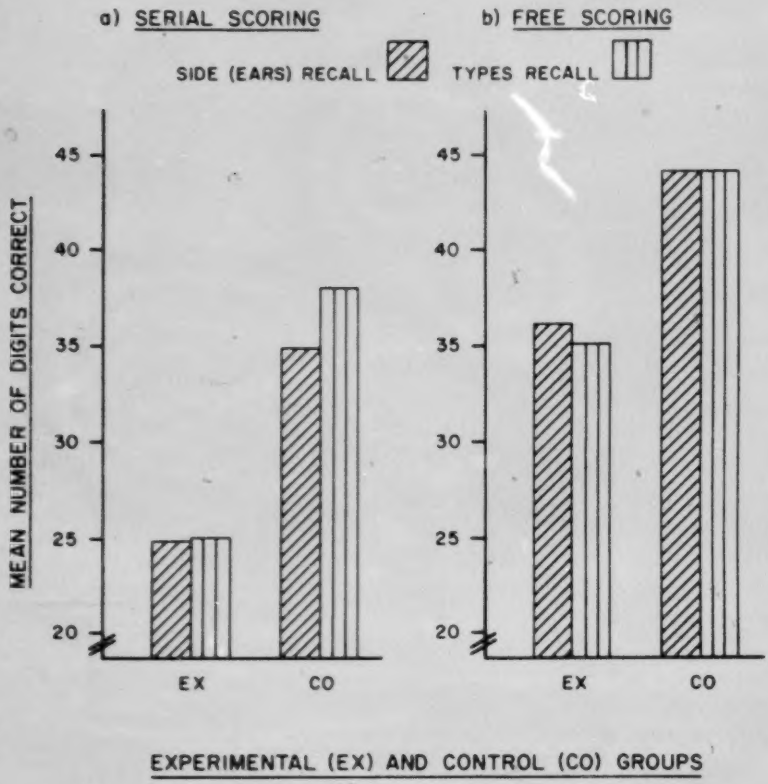


Figure 3. Differences in recall as a function of strategies (sides and types) for each group.

almost identical mean sides and types scores of 24.84 and 24.93, although the SD's differ slightly. For the Control Group, however, the "tag" effect must have taken place as evidenced by the higher mean scores for the types recall. In other words, the group resorts to the strategy of reporting elements with contents as instructed (digits/letters) rather than the more "natural" sides reported. It should be noted, however, this tag advantage is lost (with the Control Group) with free scoring which is less discriminating than serial

scoring. The results shown in Figure 3 should be interpreted in conjunction with the two group (A) x strategies (B) repeated measures ANOVA with the latter (B) repeated. In both analyses (serial scoring and free scoring) the main effects for group are highly significant (for serial scoring $F = 72.496$, 1/114 df, $p<0.001$; for free scoring $F = 47.729$, 1/114 df, $p<0.001$). With serial scoring the sides/types strategy is also significant ($F = 4.317$, 1/114 df, $p = 0.03997$) while the interaction hovers round a p of 0.051, wheras with free scoring the strategies effect is not significant. This is not unexpected in view of the more generous nature of free scoring which makes it less discriminating. Thus from the more refined serial scoring the hypothesis relating to the inefficient use of strategies in processing dichotic materials by disabled readers is upheld.

The findings here may be compared with those of Neufeldt (1966) and Yntema and Trask (1963). With 2 groups of 13 retardates each (organic and cultural-familial) matched with a normal MA group and a normal CA group Neufeldt found no significant difference, except for the cultural-familial group, between the sided and types strategies using similarly composed stimuli (digits and letters). Using digits and words, Yntema and Trask, however, established a clear superiority of types over sides strategy, thus buttressing their claim for recall as a search process. In other words, the elements by types are more reliably tagged as words or digits than as stimuli heard on the left or right ears. One could explain away these apparently conflicting findings by saying that the stimuli (letters) used by Neufeldt are not as meaningful as those (words) used by Yntema and Trask. One could further attribute the difference to the samples used: retarded and non-retarded by the former and university students by the latter team, and one might question whether normal readers and university students were not more at ease with letters and words. The more important task is to infer the relative contribution of perceptual and memorial processes. The better recall, under serial scoring, of types than sides for the Control Group, but not for the Experimental Group, seems to augment the argument of memorial processes, as advanced by Inglis and Sykes (1967). But how is one to explain the almost identical scores for the Experimental Group and almost exactly the reverse with free scoring? The more plausible explanation is the inability of children with severe reading dysfunction to use tags to process dichotic stimuli or possibly the slight pull of perceptual forces vis-a-vis memorial ones for this group. The contribution of perceptual and memorial processes is a function of, among other things, the group of children tested, their age, and

the acoustic characteristics of stimulus materials. It may, however, be safe to assert in a crude analogy with Hebb's (1949) intelligence A and intelligence B, that there are two *main* determinants to the recall of dichotic stimuli: a completely necessary perceptual mechanism and a completely necessary memorial process. With disabled readers the former mechanism will set the limit while their normal-reading counterparts are more likely to use more efficient processing strategies.

Spatial-Temporal Tasks

Materials

While the two Dichotic Experiments (DL2 and DL3) have thrown some light on auditory sequential processing of verbal materials by disabled readers, further evidence of their impairment in spatial-temporal integration is afforded in a series of factor analytic studies using both the principal component and alpha factor analyses with 8 and 10 spatial-temporal tasks. Space necessarily limits discussion to the summary of results with two of the tasks to further explain the differential use of strategies and tactics. In this context, the term strategies refers to the selection of one from a number of possible alternatives and the creation of a general plan or scheme for the performance of a task. By tactics is meant the appropriate methods and operations required to put the general scheme into effect. The two tasks to be discussed presently are the Figure Copying Test (FCT) usually attributed to Ilg and Ames (1964) and the Auditory-Visual Coding modified from the Birch and Belmont (1964) cross-modal task. In the Figure Copying Test the child is asked to copy 10 simple geometric figures from a circle to a cylinder and two cuboids. In the Auditory-Visual Coding the child listens to some patterns of 1000 Hz. discrete tones of 0.2 sec. duration separated by short pauses lasting 0.4 sec. or long pauses of 1.2 sec. Immediately after listening to the auditory stimuli, he is asked to select one of the three visual dot patterns *corresponding* to the tone patterns.

Results and Discussion

In both these "non-reading" tasks the disabled readers performed significantly worse than their controls as shown in an Hotelling T^2 when the 8

spatial-temporal tasks[2] were considered simultaneously. For Figure Copying the Hotelling T^2 of 30.302 yielded an F-ratio of 3.555 with a p of 0.001 for 8/107 df. For Auditory-Visual Coding the Hotelling T^2 of 29.675 yielded an F-ratio of 3.482 with a p of 0.0013 for 8/107 df.

Apart from the quantitative difference the qualitative aspect of *how* the children performed their tasks is even more instructive. Figure 4 shows the actual reproductions of some specimen drawings from 6 disabled readers and deserves attention. Without loss of generality, it can be said that the problem these children faced was not one of visual perception, nor was it one of the motor act of copying alone. It is one of visual-motor integration culminating in adequate visual analysis and the utilization of drawing rules. Strong proponents of similar tasks as Benton (1955), Harris (1963) and Koppitz (1970) have all emphasized the integrative aspect in copying or visual-motor retention tests. Perusal of the sample drawings and works from other children show that the two cuboids, which are the most discriminating items, are almost perceived as being two-dimensional rather than as three-dimensional as intended. This could be due in part to selective attention or selective inattention as with the familiar Rubin's Figure. The deficiency could also be due to lack of knowledge of the label "cuboids" and its associated properties. To top all this, the failure in copying figures is best explained in terms of Arnheim's (1972, p.303) "character of the dynamic vectors" and Luria's (1973, p.331) overcoming the "vectors of direct perception" or the oscillation between the mutually exclusive concave or convex versions. A further example from a dyslexic child's copying of the diamond as two triangles and the subsequent erasure of the two base lines illustrates inadequate constructional schemata. Visual configuration and details will largely delimit the drawing task; knowledge of drawing rules determines the ability of the child to construct the relationship of details and also the quality of the drawings. In fact, Olson (1970) has shown that teaching construction rules results in significant improvements in copying diagonals.

The deceptively simple Auditory-Visual Coding requires for its solution

[2] The other 6 tasks were: Raven's Coloured Progressive Matrices (1947), Memory-for-Designs Test, Visual Short-Term Memory Task, Auditory Serial Recall Task, Illinois Test of Psycholinguistic Abilities (ITPA) Visual Sequential Memory Subtest, ITPA Auditory Sequential Memory Subtest.

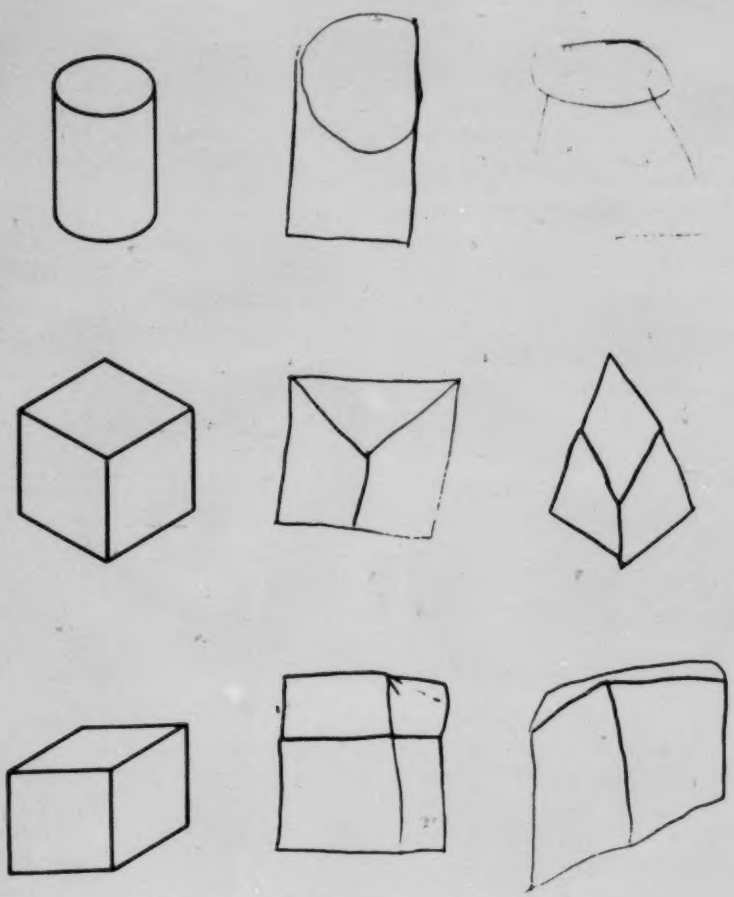


Figure 4. Specimen drawings from 6 children in copying the figures (shown on the extreme left) from the Figure Copying Task.

the understanding of strategies. The use of rules may be likened to these steps in a crude computer analogue:

DIMENSIONS—PATTERNS OF TONES, PATTERNS OF DOTS,
SHORT AND LONG PAUSES BETWEEN TONES,
SHORT AND LONG SPACES BETWEEN DOTS.

1. ATTEND TO TONES, GATE OUT IRRELEVANT CUES;
   UNDERSTAND ORDER TO TONES (SUCCESSION);
   UNDERSTAND DIMENSION OF TONES (DURATION,
   RHYTHM); RETAIN ALL OF ABOVE;
   GØTØ 2;
2. SCAN DOTS;
   UNDERSTAND ORDER OF DOTS:
   UNDERSTAND DIMENSION OF DOTS;
   RETAIN ALL OF ABOVE;
   GØTØ 3;
3. ESTABLISH EQUIVALANCE RULES (USE REPERTOIRE);
   GØTØ 4;
4. USE APPROPRIATE STRATEGIES (ALTERNATIVES);
   USE APPROPRIATE TACTICS TO OPERATE ON TASKS;
   STOP.

The notion of order, succession and rhythm with regard to temporal events (tone patterns) and the corresponding notion of spatial coordinates (visual dot patterns) are all important. The intriguing problem of cross-modal coding and of the strategies and tactics that children use to perform the task is discussed in a series of fascinating studies by Goodnow (1969, 1971a, 1971b).

Conclusion

The main study of the two dichotic listening experiments and the subsidiary one outlining the quantitative and qualitative results of two spatial-

temporal tasks have demonstrated the importance of strategies (schema) and tactics (rules and their application) and their relationship to reading dysfunction. The question may well be raised as to the appropriate strategy or strategies for individual disabled readers. It is beyond the scope of this paper to discuss the theoretical and practical bases of reading strategem. At the risk of over-simplifying, the study of linguistic awareness by researchers at the Haskins Laboratories (Liberman 1970; Liberman, Cooper, Shankweiler, and Studdert-Kennedy 1967; Kavanagh and Mattingly 1972) relates directly to initial reading and reading dysfunction and deserves closer attention. The approach of linguistic awareness and the importance of segmentation in learning to read find support in the basic and applied psychological research on the reading process by the Russian psychologist El Konin (1963, 1973); in clinical studies by I. Liberman and associates (Liberman 1971, 1973; Liberman, Shankweiler, Carter, and Fischer 1972) and in the experimental work by Calfee, Lindamood, and Lindamood (1973). The implicit knowledge of syllable segmentation is a necessary condition, albeit not a sufficient one, to explain initial reading. Nor does it mean all beginning readers or disabled readers should be taught by this approach. What it does mean is the re-examination of "perceptual training" in remedial reading and the re-affirmation of the importance of invariant symbol-sound relationship. Might not an exploration of linguistic awareness provide a clue to the understanding of specific reading disability or developmental dyslexia?

References

Arnheim, R. 1972. *Visual Thinking*. Berkeley, Los Angeles: University of California Press.

Bakker, D.J. 1972. *Temporal Order in Disturbed Reading: Developmental and Neuropsychological Aspects in Normal and Reading-Retarded Children*. Rotterdam: Rotterdam University Press.

Bakker, D.J. 1973. Hemispheric Specialization and Stages in the Learning-to-Read Process. *Orton Society Bulletin* 23:15-27.

Bakker, D.J. and P. Satz (eds.). 1970. *Specific Reading Disability: Advances in Theory and Method*. Rotterdam: Rotterdam University Press.

Benton, A.L. 1955. *The Revised Visual Retention Test: Clinical and Experimental Applications*. New York: Psychological Corp.

Birch, H.G. and L. Belmont. 1964. Auditory-Visual Integration in Normal and Retarded Readers. *Amer. J. Orthopsychiatry* 34:852-861.

Broadbent, D.E. 1954. The Role of Auditory Localization in Attention and Memory Span. *J. Exp. Psychol.* 47(3):191-196.

Calfee, R.C., Patricia P. Lindamood, and C. Lindamood. 1973. Acoustic-Phonetic Skills and Reading—Kindergarten through Twelfth Grade. *J. Ed. Psych.* 64(3):293-298.

Cherry, E.C. 1953. Some Experiments on the Recognition of Speech, with One and Two Ears. *J. Acoust. Soc. Amer.* 25:975-979.

Cherry, E.C. and W.K. Taylor. 1954. Some Further Experiments upon the Recognition of Speech, with One and Two Ears. *J. Acoust. Soc. Amer.* 26:554-559.

Connors, C.K., K. Kramer, and F. Guerra. 1969. Auditory Synthesis and Dichotic Listening in Children with Learning Disabilities. *J. Special Ed.*, 3(2):163-170.

Curry, F.K.W. 1967. A Comparison of Left-Handed and Right-Handed Subjects on Verbal and Non-Verbal Dichotic Listening Tasks. *Cortex*, 3:343-352.

Curry, F.K.W. and H. Gregory. 1969. The Performance of Stutterers on Dichotic Listening Tasks thought to Reflect Cerebral Dominance. *J. Speech Hearing Res.* 12:73-82.

Curry, F.K.W. and D. Rutherford, 1967. Recognition and Recall of Dichotically presented Verbal Stimuli by Right and Left-Handed Persons. *Neuropsychologia* 5:119-126.

Dee, H.L. 1971. Auditory Asymmetry and Strength of Manual Preference. *Cortex* 7:236-245.

Doehring, D.G. 1968. *Patterns of Impairment in Specific Reading Disability.* Bloomington: Indiana University Press.

Doehring, D.G. and S. Rabinovitch. 1969. Auditory Abilities of Children with Learning Problems. *J. Learning Disabilities* 2(9):467-475.

El Konin, D.B. The Psychology of Mastering the Elements of Reading. In B. Simon and Joan Simon (eds.), *Educational Psychology in the U.S.S.R.* Stanford: Stanford University Press.

El Konin, D.B. U.S.S.R. In J. Downing (ed.), *Comparative Reading: Cross-National Studies of Behavior and Processes in Reading and Writing.* New York: Macmillan.

Goodglass, H. 1967. Binaural Digit Presentation and Early Lateralized Brain Damage. *Cortex* 3:295-306.

Goodnow, Jacqueline J. 1969. Eye and Hand: Differential Sampling of Form and Orientation Properties. *Neuropsychologia* 7:365-373.

Goodnow, J.J. 1971a. Matching Auditory and Visual Series: Modality Problem or Translation Problem? *Child Development* 42:1187-1201.

Goodnow, J.J. 1971b. The Role of Modalities in Perceptual and Cognitive Development. In J.P. Hill (ed.), *Minnesota Symposia on Child Psychology*, Vol. 5. Minneapolis: University of Minnesota Press.

Harris, D.B. 1963. *Children's Drawings as Measures of Intellectual Maturity.* New York: Harcourt, Brace.

Hebb, D. O. 1949. *The Organization of Behaviour.* New York: Wiley.

Ilg, Frances L. and L. B. Ames. 1964. *School Readiness: Behavior Tests used at the Gesell Institute.* New York: Harper and Row.

Inglis, J. and W.K. Caird. 1963. Age Differences in Successive Responses to Simultaneous Stimulation. *Canad. J. Psychol.* 17(1):98-105.

Inglis, J. and D.H. Sykes, 1967. Some Sources of Variation in Dichotic Listening Performance in Children. *J. Exp. Child Psychology* 5:480-488.

Jones, D. and O. Spreen, 1967. Dichotic Listening by Retarded Children: the Effects of Ear Order and Abstractness. *Child Development* 38:(1)101-105.

Kavanagh, J. F. and I. G. Mattingly (eds.). 1972. *Language by Ear and by Eye: the Relationships between Speech and Reading.* Cambridge, Massachusetts: M.I.T. Press.

Kimura, D. 1961a. Some Effects of Temporal-Lobe Damage on Auditory Perception. *Canad. J. Psychol.* 15:156-165.

Kimura, D. 1961b. Cerebral Dominance and the Perception of Verbal Stimuli. *Canad. J. Psychol.* 15:166-171.

Kimura, D. 1973a. The Asymmetry of the Human Brain. *Sci. American* 228(3):70-78.

Kimura, D. 1973b. Manual Activity during Speaking—I. Right-Handers. *Neuropsychologia* 11:45-50.

Kimura, D. 1973c. Manual Activity during Speaking—II. Left-Handers. *Neuropsychologia* 11:51-55.

Knox, A.W. and D.R. Boone, 1970. Auditory Laterality and Tested Handedness. *Cortex* 6:164-173.

Koppitz, Elizabeth M. 1970, Brain Damage, Reading Disability and the Bender Gestalt Test. *J. Learning Disabilities* 3(9):6-10.

Liberman, A.M. 1970. The Grammars of Speech and Language. *Cognitive Psych.*, 1:301-323.

Liberman, A.M. F.S. Cooper, D.P. Shankweiler, and M. Studdert-Kennedy. 1967. Perception of the Speech Code. *Psychological Review* 74(6):431-461.

Liberman, Isabelle Y. 1971. Speech and Lateralization of Language. *Bull. of the Orton Society* 21:71-86.

Liberman, Isabelle Y. 1973. Segmentation of the Spoken Word and Reading Acquisition. *The Haskins Laboratories Status Report on Speech Research SR–33.* January–March, 1973.

Liberman, Isabelle Y., D. Shankweiler, Bonnie Carter, and F.W. Fischer. 1972. Reading and the Awareness of Linguistic Segments. *The Haskins Laboratories Status Report on Speech Research, SR–31/32* July–December, 1972.

Ling, Agnes H. 1971. Dichotic Listening in Hearing-Impaired Children. *J. Speech Hear. Research* 14(4):793-803.

Luria, A.R. 1973. *The Working Brain: an Introduction to Neuropsychology.* London: Penguin.

Maccoby, Eleanor E. 1967. Selective Auditory Attention in Children. In L.P. Lipsitt, and C.C. Spiker. (eds.), *Advances in Child Development and Behavior,* Vol. 3. New York: Academic Press.

Maccoby, Eleanor E. and K.W. Konrad. 1966. Age Trends in Selective Listening. *J. Experimental Child Psychology* 3:113-122.

Maccoby, E.E. and K.W. Konrad, 1967. The Effect of Preparatory Set on Selective Listening: Developmental Trends. *Monographs of the Society for Research in Child Development* 32:(No.4, Serial No. 112).

Milner, B., L. Taylor, and R.W. Sperry, 1968. Lateralized Suppression of Dichotically presented Digits after Commissural Section in Man. *Science* 3837:184-186.

Neufeldt, A.H. 1966 Short-Term Memory in the Mentally Retarded: an Application of the Dichotic Listening Technique. *Psych. Monog.* 80:12 (Whole No. 620).

Olson, D.R. 1970. *Cognitive Development: the Child's Acquisition of Diagonality.* New York: Academic Press.

Orlando, C.P. 1972. Measures of Handedness as Indicators of Language Lateralization. *Bull. of the Orton Society* 22, 14-26.

Satz, P. 1968. Laterality Effects in Dichotic Listening. *Nature* 218:277-278.

Satz, P., K. Achenback, E. Pattishall, and E. Fennell. 1965. Order of Report, Ear Asymmetry and Handedness in Dichotic Listening. *Cortex* 1(4):377-396.

Satz, P. and Gary K. Van Nostrand. 1973. Developmental Dyslexia: an Evaluation of a Theory. In P. Satz, and J.J. Ross (eds.), *The Disabled Learner: Early Detection and Intervention.* Rotterdam: Rotterdam University Press.

Satz, P. and J.J. Ross (eds.). 1973. *The Disabled Learner: Early Detection and Intervention.* Rotterdam: Rotterdam University Press.

Satz, P. and S. Sparrow. 1970. Specific Developmental Dyslexia: a Theoretical Formulation. In D.J. Bakker and P. Satz (eds.). *Specific Reading Disability: Advances in Theory and Method.* Rotterdam: University of Rotterdam Press.

Schulhoff, C. and H. Goodglass. 1969. Dichotic Listening, Side of Brain Injury and Cerebral Dominance. *Neuropsychologia* 7:149-160.

Semmes, J. 1968. Hemispheric Specialization: a Possible Clue to Mechanism. *Neuropsychologia* 6:11-26.

Semmes, J. S. Weinstein, L. Ghent, and H.-L. Teuber. 1960. *Somatosensory Changes*

after Penetrating Brain Wounds in Man. Cambridge, Massachusetts: Harvard University Press.

Sparrow, Sara and P. Satz, 1970. Dyslexia, Laterality and Neuropsychological Development. In D.J. Bakker, and P. Satz (eds.), *Specific Reading Disability: Advances in Theory and Method.* Rotterdam: Rotterdam University Press.

Symmes, Jean S. 1972. Deficit Models, Spatial Visualization, and Reading Disability. *Bull. of the Orton Society* 22:54-68.

Symmes, Jean S. and Judith L. Rapoport, 1972. Unexpected Reading Failure. *Amer. J. Orthopsychiatry* 42(1):82-91.

Treisman, A.M. and G. Geffen. 1967. Selective Attention: Perception or Response. *Quart. J. Exp. Psychol. 19:1-17.*

Treisman, A.M. and G.A. Riley. 1969. Is Selective Attention Selective Perception or Selective Response? J. Exp. Psychol. 79:27-34.

Yntema, D.B. and Frances P. Trask, 1963. Recall as a Search Process. *J. Verbal Learning and Verbal Behavior,* 2:257-258.

Zurif, E.B. and M.P. Bryden. 1969. Familial Handedness and Left-Right Differences in Auditory and Visual Perception. *Neuropsychologia* 7:179-187.

Zurif, E.B. and G. Carson. 1970. Dyslexia in relation to Cerebral Dominance and Temporal Analysis. *Neuropsychologia* 8:351-361.

Follow-Up Study of 216 Dyslexic Children

Carl L. Kline, M.D. C.R.C.P. (C)
Carolyn Lacey Kline

Carl L. Kline is Clinical Associate Professor, Department of Psychiatry, Faculty of Medicine, University of British Columbia, Vancouver. Carolyn Lacey Kline is a Psychoeducational Consultant in Vancouver.

Despite the extensive, ever-expanding literature on various aspects of reading disability, there is a surprising dearth of follow-up studies on the results of remediation. The largest series of followed-up cases was that reported by Monroe (1932), comprising 235 children. The most extensive longitudinal study was published by Margaret Rawson (1968). Fernald (1957) reported 62 cases of non-readers ages 8–17 all of whom achieved "a normal or superior performance in reading." Limited additional studies have been done by Monroe, Birch, and others (see Vernon 1957).

Unfortunately many findings are of little value because of inadequate diagnostic data and poorly researched progress reports. Some comprise such small numbers of cases that they are statistically invalid. Other studies do not specify the kind of remedial therapy, often failing even to indicate the frequency or the length of sessions. Vernon (1957) lamented the fact that "the number of controlled studies of the actual improvement made over any length of time is so small."

During the past four years, the writers have evaluated 750 children referred by family doctors because of possible severe learning disabilities. Although the majority of patients were from the Greater Vancouver area, many came from other parts of British Columbia, from the Yukon, the Northwest Territories, and Washington State. Each patient had been examined for physical disabilities, including gross neurological problems. Our diagnostic study included extensive psychoeducational testing and neuropsychiatric evaluation. One or both parents was always involved in the diagnostic process.

This paper was presented at the World Congress on Dyslexia, Rochester, Minnesota, November 1974.

This study was made possible by two grants from the Provincial Government of British Columbia (New Democratic Party), through the Ministers of Health and Education.

The compiling of the accumulated data was carried out by two research teams working separately for two successive summers. The first team was made up of two university graduate students and the second team of two medical students and a dental student. Because an examination of the two sets of data separately showed insignificant variations in results, their combined data analysis is presented here.

In this paper some of the basic test findings will be presented as essential background for presentation of the follow-up study. A description of test batteries, the selection and training of remedial therapists, the type of remedial therapy used, and the results in treated and untreated dyslexic children will be presented. Finally there will be a brief discussion of the implications of the findings in the follow-up study.

Each child received the nineteen tests shown in Table I. The testing was done in one session requiring about three hours. (The same test battery was used in reevaluated cases as was used initially.) In a second session the child and parents were seen for psychiatric evaluation and interpretation of all findings. At that time, when indicated, recommendations were made for therapy.

The battery of tests was selected on the basis of twenty years experience in evaluating children for reading disability. (Other tests, such as the Frostig and ITPA were discarded earlier on the basis of our own experience and reports in the literature.) Although the diagnosis of dyslexia can be made, in many cases, without such extensive testing, we feel that this testing enhances the accuracy of diagnosis. Also, this battery provides helpful information for planning therapy for the dyslexic child.

Our criteria for the diagnosis of developmental dyslexia is based on the definition of the World Federation of Neurology as proposed in its 1968 conference on dyslexia: "A disorder manifested by difficulty in learning to read despite conventional instruction, adequate intelligence, and sociocultural opportunity. It is dependent upon fundamental cognitive disabilities which are frequently of constitutional origin" (Critchley 1970). To this definition we add the provision that the child has adequate vision and hearing.

The Basic Data

Table 2 indicates the results of diagnostic testing in the total 750 cases referred for evaluation. The 24 percent without dyslexia either had mild

Table 1
Psychoeducational Test Battery used
for Evaluation and Re-Evaluationn

1. Wechsler Intelligence Scale for Children
2. Peabody Picture Vocabulary Test
3. Bender-Gestalt Test (Koppitz Scoring)
4. Draw-A-Person Test (Goodenough Scoring)
5. Jastak (W.R.A.T.) - Reading, Spelling, Arithmetic
6. Iota
7. Grays Oral Paragraphs
8. Reading from Standard Basic Readers
9. Copying Sentences
10. Writing from Dictation
11. Writing and Saying Alphabet
12. Monroe Auditory Discrimination Test
13. Monroe-Auditory-Visual Learning Test
14. Phonics Test
15. Test for Auditory Recall and Sequencing
16. Handedness Tests (including Schilder)
17. Right-left Orientation
18. Social Perception
19. Expository Writing

secondary learning problems, emotional problems, or no problems. In considering the importance of the 24 percent without dyslexia seen by us, it must be remembered that all of these cases were referred because of suspected reading disabilities. At the Langley Porter Child Psychiatry Clinic in San Francisco, 30 to 50 percent of all children seen in the Clinic are found to have severe reading disability (personal communication). This is compatible with our experience in a child guidance clinic in Wisconsin where one third of the children coming to the clinic were found to have dyslexia (Kline et al. 1968).

No attempt will be made to discuss the full implications of some of the basic test findings because of the limitations imposed by the purpose of this paper. Variation in number of cases reported in various categories is due to:

Table 2. Total Cases Seen
(N=750)

	Number	*Percent*
Total Cases Seen	750	100
With Dyslexia	571	76
Without Dyslexia	179	24

(1) incomplete data in some cases; (2) difficulty in making a clear interpretation of some recorded data.

Table 3 reveals that of 571 children with dyslexia, the ratio of boys to girls was 4:1. Most other studies report comparable findings (Kline and Lee 1974; Monroe 1932; and Vernon 1957).

The age distribution graph in Figure 1 indicates that recognition and treatment of severe reading disability is not occurring early enough in the schools; only 30 percent of cases were identified before the child's ninth birthday and only 41 percent before his tenth. Over 30 percent were not recognized until after age 12. Many of these cases had been described as "being a little slow in reading" but there was no accurate diagnosis nor was effective remedial therapy provided.

Grade distribution of our patients when first seen is shown by the graph in Figure 2. Not shown in the graph is the fact that 29.8 percent of our cases had failed one grade and 4.8 percent had repeated more than one grade. (This seems especially significant because of the growing acceptance by schools of the no-fail philosophy.)

Table 3. Sex Dstribution
(N=571)
Ratio 4 - 1

	Number	*Percent*
Boys	460	80.6
Girls	111	19.4

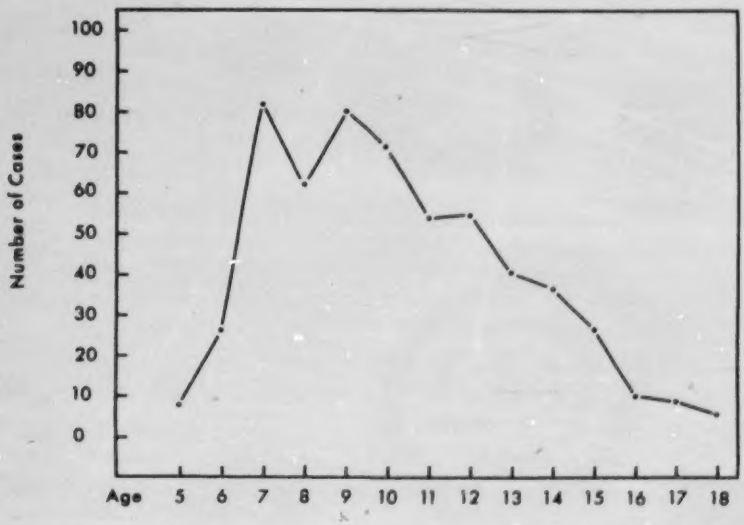


Figure 1. Age distribution when patients were first seen. (N=564)

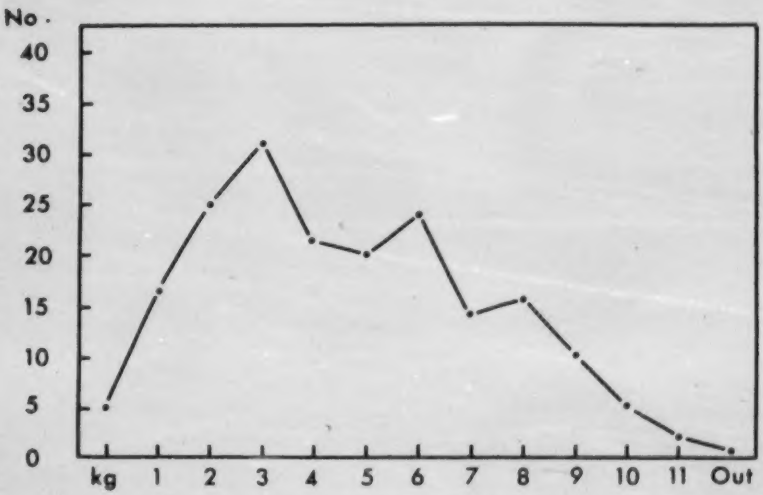


Figure 2. Grade distribution when patients were first seen. (N=188)

Other studies have indicated an increased incidence of reading disability among older children. In an unpublished American study, Arthur Henderson (personal communication) tested an entire grade 11 class for reading levels and I.Q. scores for six consecutive years. A total of 3541 students were tested of whom 47 percent were found to be retarded in reading from one to six and one-half years. Henderson reported that this reading retardation was not associated with low intelligence; only 24 percent of the total had scores below 90 on the Henmon-Nelson Test.

In our experience, relatively few teachers have been trained to perceive the reading-disabled child as a victim of a specific syndrome. They see him as emotionally disturbed, lazy, culturally deprived, dull, hyperactive, or immature. Even if the child *has* been diagnosed, few teachers have the training or the time to provide meaningful remediation.

In our experience repeated expressions of concern by parents about their child's reading go unheeded by teachers, beginning in grade one. Only 28 percent of the 571 cases reported here had received any kind of diagnostic tests in the schools. Even when a child is tested in the schools, the parents often are not told the results of the tests.

Causative Factors

Our study suggests that family problems are not a significant causative factor in dyslexia. The percentage of divorced parents (4.6 percent total) is comparable to that in the general population (4.3 percent in Canada). Only 9.6 percent of families studied had significant family problems, whereas over 30 percent of the general population has such problems.

The incidence of prematurity (four percent) and other birth complications (3.4 percent) was so low as to have no statistical significance. Because careful inquiry was made about these factors in every case, our data appear to be reliable. The incidence of premature births in the general population in Canada is reported to be seven percent (Dominion of Canada Bureau of Statistics 1969).

Allergy has sometimes been suggested to be a possible causative factor in dyslexia. In our series of cases nearly 19 percent were found to suffer with some kind of allergy, but 25–50 percent of the general population of children are reported to be allergic (Fontana 1969, *Practical Management of the Allergic Child*).

Handedness and Cerebral Dominance

Family History. Left-handedness was present in the families of 49 percent of the dyslexic children in this series; another eight percent of families had a history of ambidexterity. This high percentage of left-handedness and ambidexterity in the family histories is coupled with the equally impressive finding that 50 percent of the dyslexic children had a family history of reading disability. These findings are supportive of other studies (Eisenberg 1966; Sladen 1972) suggesting a familial factor in dyslexia.

The Patients. Table 4 indicates the findings for handedness and for the Schilder Test (Schilder 1935; Silver 1961) in 505 dyslexic children. The incidence of left-handedness is triple that in the normal population. Although the percentage with abnormal Schilder Tests is high (39.9 percent), the findings do not support Silver's (1961) statement that "if a child has a reading disability, the chances are about 90 of 100 that he will have an abnormality on the extention test."

Problems in right-left orientation were found as follows: for own right and left 16.6 percent, for examiner's right and left 31 percent. Silver (1960) found that 90 percent of his series had right-left problems whereas he found no such problems in the control group.

According to Silver, the Schilder Test indicates basic laterality and a contradictory test or equivocal test indicates crossed cerebral dominance. Orton (1937) and others (Corballis and Beale 1971; Geshwind 1972; Kinsbourne and Warrington 1966) have found crossed cerebral dominance to

Table 4. Cerebral Dominance
(N=505)

	Number	*Percent*
Right-handed	392	77.7
Left-handed	81	16.0
Ambidextrous	32	6.3
Equivocal Schilder	117	23.2
Right-handed, Left Schilder	68	13.5
Left-handed, Right Schilder	16	3.2
Total Abnormal Schilder	201	39.9

be a basic problem in dyslexia. Although the data in this study is not as convincing as that in Silver's studies, it does support the concept of the importance of mixed or ill-established dominance in dyslexia.

Intelligence

Amidst a good deal of residual controversy about the role of intelligence in the etiology of reading disabilities, the prevailing view is that intelligence is not a dominant factor in learning to read, providing that the child is not grossly retarded (Frost 1963; Kline and Lee 1974; and Vernon 1957). Clearly, intelligence is of great importance in comprehension and in abstract thinking. Also there is interesting material in the literature concerning the relationship of differences in the Wechsler Intelligence Scale for Children (WISC) performance and verbal scale scores to dyslexia, many studies indicating that dyslexics tend to score lower on the verbal scale although others show the opposite findings. Other studies reveal the significance in dyslexia of sub-test scatter on the WISC (Ellis and Peters 1970; Vernon 1957).

Five hundred and thirty-one children received the Peabody Picture Vocabulary Intelligence Test. This test tends to correlate closely with the Verbal Scale on the WISC except in cases in which the child has difficulty in expressive language, in which event he is likely to score lower on the Verbal Scale on the WISC than on the PPVT. Figure 3 shows the distribution of scores on the PPVT.

The WISC was given to every child during the last 15 months of the study. WISC findings in 146 dyslexic children are presented in Figure 4.

The key findings from psychological testing are: (1) Only 20 percent of cases scored an I.Q. below 90 on the WISC and only 18 percent did so on the Peabody. (2) Twenty-four percent of cases scored above average in intelligence on the WISC and 30 percent did so on the PPVT. (3) The majority of cases had higher performance than verbal I.Q.'s. (4) Significant WISC sub-test scatter occurred in 91 percent of cases. There is no evidence from these findings that intelligence is significant as a *causative* factor in dyslexia. A further analysis of these test findings is in preparation.

Other Psychoeducational Test Battery Results

Table 5 shows the incidence of abnormal findings, in order of frequency, in the other psychoeducational tests, excluding specific reading and spelling

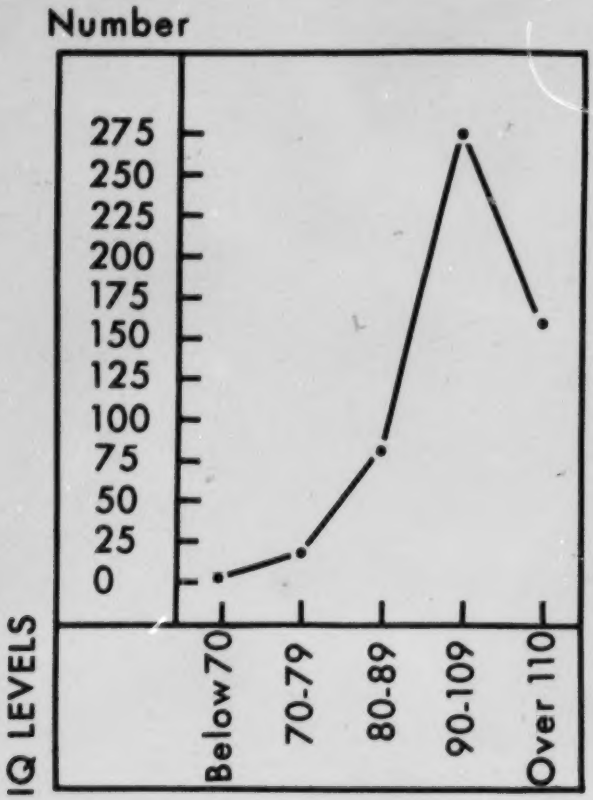


Figure 3. Distribution of scores on the Peabody Picture-Vocabulary Test. (N=531)

tests. Most dyslexic children have abnormal findings in eight of the first ten test items in this table. A detailed study and analysis of these data will appear in another paper.

Scores on the Wide Range Achievement Tests (reading, spelling and arithmetic), on the Iota, on Gray's Oral Paragraphs, and on reading from a basic reader were recorded and analyzed. The data are too detailed and complex to present here. We find that Gray's Oral Paragraphs, the Iota (up to

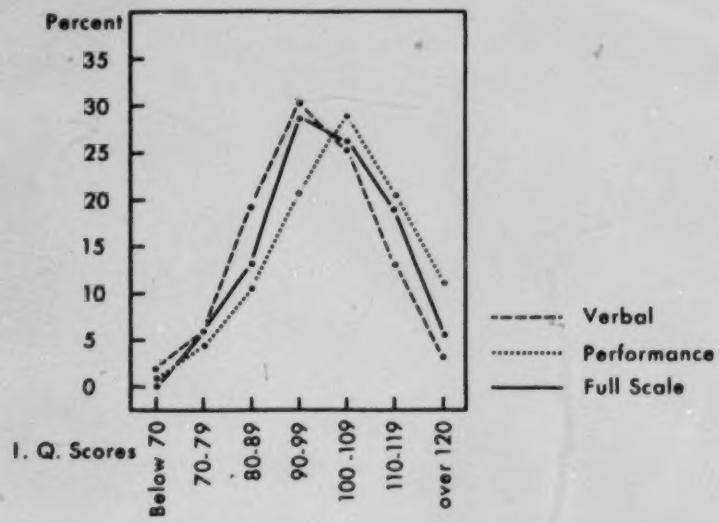


Figure 4. WISC scores for 146 dyslexic children.

grade 5) and reading from a basic reader are the most sensitive reading tests. In our experience, a written spelling test is the most sensitive of all tests in indicating the presence of a language problem.

It is our opinion that no one reading test is sufficient for accurate identification and diagnosis of a reading disability. Further, none of the existing reading indices offer reliable specific guidelines for indicating the severity of the problem in all cases. We have published work indicating the usefulness of the Dyslexia Quotient (Kline, Carl L. et al. 1968a; Kline, Carl 1968b). Although this Quotient is a simple, practical way to indicate the degree of disability in dyslexia, it has not gained wide recognition or usage and therefore was not used in this study.

The Treatment Program

Orton-Gillingham remedial therapy was advised for all children diagnosed as dyslexic. We believe that maximum benefit from this therapy necessitates adhering to the basic principles so painstakingly developed by Orton (1937),

Table 5. Psychoeducational Test Findings

	Total Cases	*Abnormal*	
		Number	*Percent*
Expository Writing	290	253	87.2
Doesn't Know Phonics	531	462	87.0
Draw-A-Person Test	423	340	80.4
Revisualization	409	304	74.3
Auditory Recall	525	382	72.8
Bender Gestalt	402	264	65.7
Transmodal Learning	528	318	60.2
Receptive Language	160	83	51.9
Expressive Language	163	80	49.1
Alphabet	371	182	49.1
Social Perception (Abstract)	172	68	39.5
Auditory Discrimination	485	135	27.8
Social Perception (Concrete)	172	68	22.7

and Gillingham and Stillman (1960). However, in order to meet the needs of large numbers of children or to respond to complex situations, modification in applying these techniques may be essential. At the same time, it is important to guard against using inappropriately the term "Orton-Gillingham method" for methods bearing little or no resemblance to the original program.

In conjunction with this highly structured alphabetic-phonics multi-sensory system, we utilized the McCracken-Walcutt Basic Readers (1969) which have a phonetically-controlled vocabulary. Until the child was able to encode and decode accurately, all reading was oral and stressed structural rather than content meaning. Tutors supplemented the material in the Basic Readers by writing suitable short stories and riddles. The research of Jeanne Chall (1968) and the writings of Margaret Rawson (1970) are important basic contributions to an understanding of teaching the langugage as it is.

Each child was seen for four or five times weekly in one-hour sessions on a one-to-one basis. Whenever possible the child worked within school, during

the school day, preferably during the language arts period. If the school did not permit the private tutor to come into the school, the child was seen in his own home or in the tutor's home during the school day. (After a day in class the dyslexic child is too exhausted and emotionally drained to use the help effectively.) Whenever possible therapy was continued throughout the summer. Every effort was made by the tutor to work in close coordination with the child's teacher and principal.

Therapeutic (Remedial) Tutors

The remedial tutors in this study were called therapeutic tutors in recognition of the fact that they were concerned with the functioning of the whole child.

Over the past seven years, we have trained nearly 400 therapeutic tutors in British Columbia. A university degree is a prerequisite; teacher's certificates are held by almost half of our tutors. In choosing tutors, we always place great emphasis upon personality as well as upon intellectual and cultural interests.

One of the exciting results of our work is that we have demonstrated beyond doubt that effective tutors can be trained in brief, intensive training programs. Our program covers a three-week period and includes prescribed reading; listening to seven 45 minute audio-tapes on various aspects of remedial therapy; lectures; demonstrations; and supervised work. Heavy emphasis is placed upon the importance of adhering to the basic methodology. Following this training period those who work as private, fee-for-service tutors in our program are assigned cases. They receive a copy of the psychoeducational report and are briefed on the case. They go to the home to meet the parents and the child, and also go to the school to meet the teacher and the principal, the parents having arranged permission for the tutor to work there.

After 16 years experience in training and utilizing therapeutic tutors we are satisfied that carefully selected tutors who have received brief, intensive training can treat severely dyslexic children successfully. Full effectiveness requires support, consultation, and continuation of training while teaching takes place. Although a one- or two-year training program would be ideal, such programs unfortunately are impractical on a wide basis at this time.

Follow-Up Study of Treatment

In analyzing the results of treatment, the research assistants determined the amount of improvement before they knew whether or not the child had received Orton-Gillingham therapy. The following criteria were used in determining the degree of improvement:

a) "Some": Definite improvement in test scores but still scoring below grade level. Knowledge of phonics improved. Little or no changes in underlying problems.* Progress slow as related to length of time tutored.
b) "Marked": Reading up to grade level and knows basic phonics. Associated decrease in underlying problems.
c) "Dramatic": Reading up to or above grade level in a short period of time; thorough knowledge of phonics. Associated decrease in underlying problems.

During the past four years 92 patients originally diagnosed as dyslexic and who received the recommended Orton-Gillingham therapy were reevaluated. An additional 29 cases who had not received the recommended Orton-Gillingham program were reevaluated. Some of this latter group had received no special help while others had been exposed to a variety of programs in the schools (language experience, whole-word, Kephart, as well as a "smorgasbord" approach). Table 6 shows the results of these two groups. Note that only 4.3 percent of the Orton-Gillingham group showed no improvement whereas 55.2 percent of the untreated group was unimproved. A survey of the Orton-Gillingham treated cases who did not do well revealed that success with the method is closely related to the skillful application of the basic method.

An additional 95 patients were selected at random for follow-up by telephone interview with a parent, usually the mother. Forty-eight of these patients were receiving or had received Orton-Gillingham therapy and in these cases tutors' reports were also available to aid in the assessment. The other 47 cases had not received the recommended Orton-Gillingham therapy. Table 7

*"Underlying problems" refers to problems in auditory recall, revisualization, transmodal learning, and audiovisual perception.

Table 6. Dyslexia Follow-Up Study
Cases with Complete Re-Examination
N = 121

	Amount of Improvement			
Groups	*None*	*Some*	*Marked*	*Dramatic*
Orton-Gillingham Treated N = 92	4.3	31.5	46.7	17.5
Untreated or School Treated N = 29	55.2	27.6	13.8	3.4

Table 7. Dyslexia Study
Telephone Follow-up (Parental Interviews)
(N = 95)

	Percent Improved	*Percent Unimproved*
Orton-Gillingham Treated N = 48	95.3	4.7
Untreated or School Treated N = 47	54.8	45.2

presents the results in those two groups of patients. It is interesting that the parents of children receiving Orton-Gillingham reported results essentially the same as we found in our extensive re-testing of the 92 children presented in Table 6. However, in the case of those not receiving the recommended help the parents reported ten percent fewer as unimproved than we found in our reevaluation study.

Table 8 presents results when both groups are combined. The untreated group can be viewed as a control group, reflecting what happens to children with severe dyslexia not receiving Orton-Gillingham therapy as compared to the results for those receiving the recommended help.

An analysis was made of treatment results according to age and length of treatment, using only those cases who had received complete reevaluation. Although the control group, consisting of those 29 patients who did not receive Orton-Gillingham therapy, is small, the findings are still of interest. Figures 5 and 6 show the results graphically. In Figure 5, it is clear that good results are related to length of time treated. Surprisingly, there is no significant relationship between results of treatment and age groups, although the older children did somewhat better than did the younger (Figure 7). The

Table 8. Dyslexia Study
Combined Follow-up Study
(Patients Re-tested and Parental Interviews Only)
N=216

	Percent Improved	*Percent Unimproved*
Orton-Gillingham Treated N = 140	95.7	4.3
Untreated or School Treated N = 76	51.0	49.0

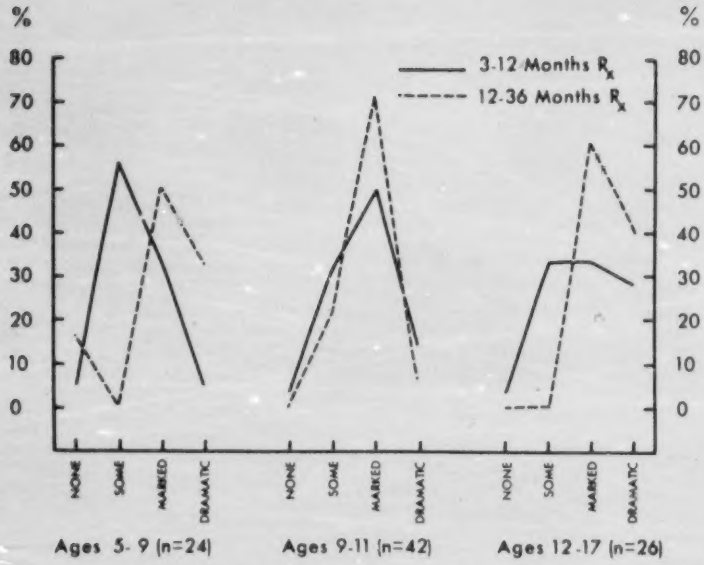


Figure 5. Results of Orton-Gillingham treatment related to age and duration of treatment.

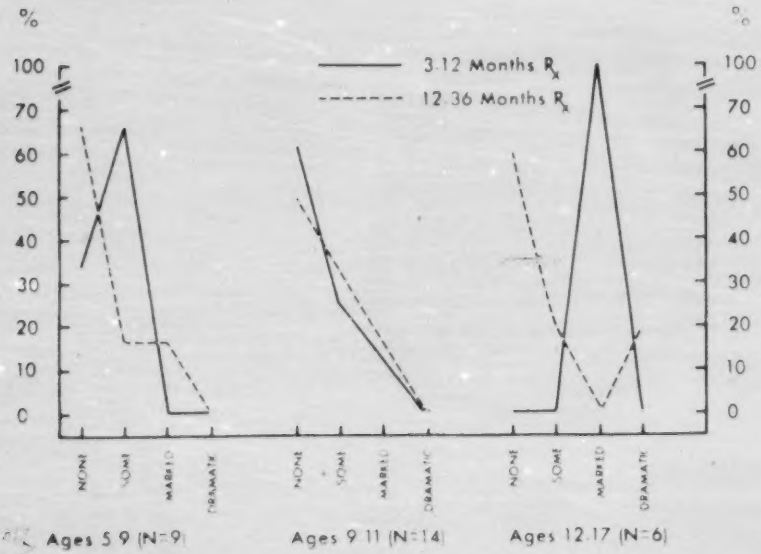


Figure 6. Results of school remediation related to age and duration of treatment.

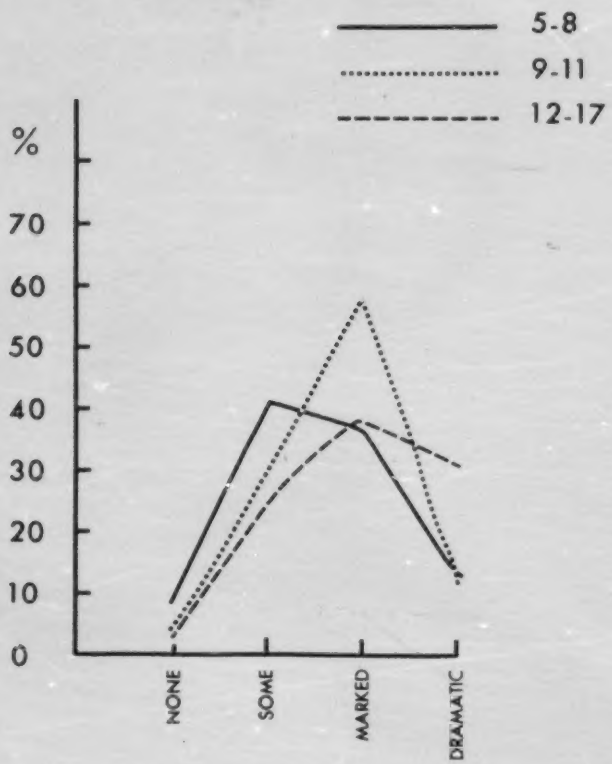


Figure 7. Results of Orton-Gillingham tutoring by age groups (N=92).

analysis by age in this group of patients lends support to the importance of providing effective remedial help, regardless of the child's age. There is a rather widespread misconception that it is a waste of time to work with older children. Our experience disproves this idea. This in no way alters the importance of early identification and remediation in dyslexia.

Summary and Conclusions

A large group of thoroughly studied children were diagnosed as having developmental dyslexia. Some of the essential facts derived from the diagnostic evaluation have been presented. Follow-up studies with complete reevalua-

tion were made in 92 Orton-Gillingham treated children and in 29 who did not receive Orton-Gillingham treatment and the results have been presented in this paper. Finally, 95 patients (48 of whom had received Orton-Gillingham therapy) were followed by means of telephone interviews with the parents and tutors' reports and the data are presented here.

From this follow-up study we feel that the following conclusions are justified:

1. Children with severe dyslexia who received Orton-Gillingham therapy made impressive gains in relatively short periods of time in nearly 96 percent of cases.
2. Of those who did not receive Orton-Gillingham therapy 49 percent failed to make progress. This appears to reflect: (1) the failure of schools or parents to follow the recommendations and/or (2) the use of ineffective remedial programs.
3. Length of treatment is an important factor in obtaining good results in remedial therapy. Most cases, in our experience, require up to two years of therapy. Some children with especially severe problems may require three or more years of help.
4. The age of the child is not a crucial factor in terms of ability to utilize the Orton-Gillingham therapy effectively. Empirically, we have learned that older children present more complications and require mature, experienced tutors.
5. Parents are very sensitive to their children's reading disabilities. A high percentage of mothers and fathers in this study had expressed concern about their child's reading problems very early in his school career but often had been rebuffed by school personnel.
6. Dyslexic children can be treated very successfully by briefly but intensively trained therapeutic tutors utilizing Orton-Gillingham methods. To avoid complications and ensure success, continued support, consultation, and ongoing training are essential.

We wish to acknowledge and express appreciation to our research assistants for their dedication to the work and their diligence in completing it. Those who were involved, all of the University of British Columbia were: James A. Coppin, Helen Gillette, Jonathan L. Kline, Keith L. Lim and Jim Stabler.

SAMUEL T. ORTON, M.D. WHO WAS HE?

A program in memory of Dr. Samuel Torrey Orton, whose name the Society bears, was arranged for the annual banquet meeting at the 25th Anniversary of the Orton Society. In response to the topic question, "Samuel T. Orton, M.D. Who Was He?" Mrs. Orton gave a biographical sketch, supplemented by the personal memories of several of his former associates and friends, and Richard L. Masland, M.D. and Margaret B. Rawson commented on his impact on the fields of neurology and education.

Part I. Biographical Sketch and Personal Memories

June L. Orton (Mrs. Samuel T. Orton);
Lloyd J. Thompson, M.D.; Paul C. Bucy, M.D.;
Lauretta Bender, M.D.; Mary Helen Robinson;
and *Paula Dozier Rome* (in order of speaking)

Mrs. Orton:

Sam Orton was born in Columbus, Ohio, on October 1, 1879, the son of Edward Orton, LL.D., a noted geologist, who was then president of Ohio State University, and Anna Torrey, whose sister was later the mother of President William Howard Taft. Although rather a delicate child, Sam was described by an older sister as "the imp" at the age of four, and his participation in the activities of his neighborhood friends seems to have been one of the reasons his parents decided to send him East to his cousin, Horace Taft, for his college preparatory years. Although he did not shine as a scholar at Taft School, his pranks in pursuit of "science" were long remembered there. It was to his father, however, that Sam felt indebted for his real education. As a boy, he would tag along with his father's classes on their geology trips, from which he developed a lifelong interest in Nature as well as his keenness of observation and the writing of precise scientific reports. There was also a certain rhythm in Dr. Orton's written lectures, which he himself thought he might have gained from the cadences of the King James version of the Bible which his father often read aloud to his family—along with commentaries from the Greek and Hebrew texts.

Sam Orton's college years were spent at Ohio State University from

which he graduated with a B.S. degree in 1901, in spite of some loss of time because of trouble with his eyes. He suffered from severe migraine headaches throughout his adult life. Both of his parents died at about this time and the Columbus home was closed, leaving him very much on his own and with limited resources, when he entered the Medical School of the University of Pennsylvania in the Class of 1905. He earned money during some of his summer vacations by digging in the Ohio Indian Mounds, and as a medical student he undertook a research project under the auspices of the State Archeological Society which resulted in the publication, before he graduated, of his first scientific paper, entitled, "A Study of the Pathological Changes in Some Mound-Builders' Bones from the Ohio Valley, With Especial Reference to Syphilis."

Dr. Orton continued his training in pathology the following year in the laboratories of the eminent Dr. Frank B. Mallory at the Boston City Hospital, and it was there that he became acquainted with Dr. Elmer E. Southard, who invited him to participate in the intricate pathological study of the brain of a hydrocephalic patient at the Danvers (Mass.) State Hospital in 1906. Thus was Dr. Orton embarked on his medical career as a neuropathologist. He later spent four years in that capacity at the Worcester (Mass.) State Hospital where Dr. Adolph Meyer of Johns Hopkins fame had preceded him. This was followed by an interim of special study in the laboratories of Professor Alsheimer in Germany in 1913.

Upon his return, Dr. Orton accepted an appointment as Pathologist and Scientific Director at the venerable Pennsylvania Hospital for the Insane in Philadelphia, where he served for the next five years. There he was able to work with the neurological and psychiatric patients in the hospital wards which enabled him to make closer correlations between various symptoms and the *post mortem* findings in the laboratory. This bedside experience may have increased his natural sensitivity to the feelings of people in distress.

This was the time of World War I which brought about a revolution in psychiatry, taking it out of the mental hospitals to the battle fronts, opening up many services to wounded and "shell-shocked" soldiers upon their return, and developing preventive mental hygiene programs for civilians. Shortly after a new type of hospital, the psychopathic hospital, was developed in three centers, Ann Arbor, Boston, and Baltimore. Dr. Orton received a call, in 1919, to go to Iowa City to build and direct a psychopathic hospital there and establish a Department of Psychiatry at the University of Iowa's College of Medicine. (Thus Dr. Orton was Director of the Iowa State Psychopathic

Hospital when he started his work with children with specific language disabilities in 1925.)

One of Dr. Orton's first tasks in his new assignment was to select doctors for his hospital staff. This took him to the Boston Psychopathic Hospital to consult with its director, his old friend, Dr. Southard. Among those recommended for him to interview was a young doctor by the name of Lloyd J. Thompson. He did not go to Iowa but their paths crossed again in later years when Dr. Orton was working in New York and Dr. Thompson was teaching psychiatry in the Medical School at Yale University. What was Dr. Orton like in those days? Dr. Thompson has been asked to contribute his memories to the narrative.

Dr. Thompson:

I first met Dr. Orton in 1920 at the Boston Psychopathic Hospital, where I was just a plain young resident, in training. Fortunately for me, there was some delay about an appointment, so we sat on a bench in the lobby getting acquainted for what was to me a memorable fifteen or twenty minutes. He impressed me as being an exceptionally fine man, with a soft voice and kindly features. I was impressed, too, that he did not talk about his own plans for going to Iowa, although he knew that I was aware of them. Rather, he was interested in what we were doing at our hospital, and in what I was doing, too. I thought that was remarkable—that he should be interested in *me*.

Later on I learned that he was going to take with him to Iowa in the same capacity our Chief of Staff, Dr. Lawson Lowrey. Dr. Lowrey and I knew each other well; we had both come from Missouri and he had given me my job. He asked me if I would go with him to Iowa as a resident, but I was unable to do so, for I had promised to return to St. Joseph, Missouri to help my father with his private sanitarium. I missed a fine opportunity, but I have always remembered Dr. Orton very well—our sitting on the bench discussing things as if a youngster like me and his point of view mattered.

Also at our hospital at the time were several brilliant and charming girls from the Smith College School of Social Work, working on their field placements in a psychiatric social work program started by Dr. Southard. One of them was June Lyday, who later became part of Dr. Orton's mental hygiene clinic team. I didn't go to visit them in Iowa, although I often wanted to!

I met Dr. Orton again in 1938 when he gave a talk at the Connecticut Medical Society. It was my privilege to take him to the amphitheater. A storm was raging and it grew worse while he was speaking. Trees were swaying and then blowing down, but he talked right through the famous New England Hurricane of '38. With trees down all around, the taxi ride to the railroad station was quite an adventure.

After Word War II and after Dr. Orton died, I was at Bowman-Gray School of Medicine in Winston-Salem, North Carolina, where I persuaded June Lyday Orton to join us to form the Orton Language Clinic. With Mollie Masland and Roger Saunders already there as speech therapist and as intern in psychology, respectively, and with some other people, we had a fine nucleus for the new language clinic.

Perhaps you think that in mentioning these other people, I am getting far afield from what I was supposed to say about Dr. Orton, but am I? This is part of the way his work and his spirit were carried on.

Mrs. Orton:

Under Dr. Orton's direction, the Iowa State Psychopathic Hospital became a flourishing institution, introducing the newer concepts of early care for psychiatric patients both in the hospital and through its outpatient department and its consultation services to the other State hospitals and institutions for children. Courses were offered not only to medical students but to those in nursing, psychology, sociology and other disciplines.

Research projects were set up and Dr. Orton's own courses in neuropathology not only provided the medical students with basic training in scientific methodology but attracted students to Iowa for the opportunity to work with him. Paul C. Bucy and Lauretta Bender were among Dr. Orton's students in the 1920's who remember him well.

Dr. Bucy:

To the parched wanderer in the desert an oasis is both a welcome and an unexpected sight. So was Samuel T. Orton at the University of Iowa in the 1920's. A member of a distinguished family of educators who had been associated with Ohio State University, Orton had come to Iowa from Pennsyl-

vania, to set up a comprehensive psychiatric service at the University's Medical School, and later, funded by the Rockefeller Foundation, to carry out innovative research.

During his tenure, he was one of the few members of the medical school faculty who had a clear idea of what constituted research. As a result he attracted and stimulated a small group of students with similar interests. These included Lauretta Bender, the late William V. Cone, Lauren H. Smith, myself, and some others.

I should like to tell you how Dr. Orton influenced me, which may give you some idea of the kind of man he was. During the summer vacation between my freshman and sophomore years in medical school I decided that I would become a brain surgeon, although there was no neurological surgeon in Iowa at the time. When I called upon Dr. Orton, he encouraged me and suggested that if I intended to operate on the brain I should learn something about the diseases which affected it. To this end he offered me an undergraduate assistantship in neuropathology. I worked in the research laboratories at the Iowa Psychopathic hospital with Lauretta Bender, also a medical student. I lived in the hospital and paid for my keep by doing physical examinations of the patients and running the clinical laboratory.

I am sure that Dr. Orton was not surprised when the "research" which I did was of little significance, for its product was not his primary interest: my education was. His objective, in which he succeeded, was to give me an insight into the difficulties of research, the need for care and accuracy, and the importance of purposeful observation.

A few years later I had another typical encounter with Dr. Orton. Almost simultaneously I had been offered two opportunities for training in neurosurgery. One was with an outstanding neurosurgeon at the University of California and the other was with Percival Bailey at the University of Chicago. I was torn between the two offers and I went to Columbus to consult my old friend and teacher, Sam Orton. Without hesitation he advised me to go with Bailey, which I did, and this proved to be one of the wisest decisions of my career.

Dr. Orton was professor of both psychiatry and neuropathology at Iowa, as well as director of the Iowa State Psychopathic Hospital. He was a biological psychiatrist: he was no psychoanalyst. He believed that the mind was related intimately to the functions of the brain. During this period he was attempting to formulate his idea that there were people, particularly children, who appeared to be mentally retarded, although often they were not, because

the verbal symbols used to convey meaning meant little to them. He spoke of this as asymbolia.

Unable to convince his colleagues, despite the soundness of his ideas and his careful presentations, he left Iowa frustrated and discouraged. However, he continued to move toward the conclusions on the nature of the language function and its disorders to which his work at Iowa had led, and from which the Orton Society took its start.

I am deeply indebted to Samuel Torrey Orton: he gave me opportunities but most of all he gave me wise counsel. His ideas were far in advance of his time, and in some respects they are still ahead of our own, waiting out there for the newer trends in scientific research to catch up with them, as, one by one, they seem to be doing.

Mrs. Orton:

Dr. Orton's work with children with specific language disabilities began at the Iowa Psychopathic Hospital with his organization and direction of an experimental Mobile Mental Hygiene Unit and his subsequent identification of a specific reading disability in a 16-year-old-boy, "M.P.," in the clinic he held in Greene County, Iowa, in January, 1925. The finding of reading disabilities in various degrees in 14 other children referred in this one county because of educational and behavioral problems impressed Dr. Orton with the extent and significance of this learning disorder. He arranged to study "M.P." intensively at the Hospital, sought out other cases, and in May produced his landmark paper, " 'Word-Blindness' in School Children." (Reprinted in Orton Society Monograph No. 2, pp. 17–31.)

This was followed by Dr. Orton's proposal to the Division of Studies of the Rockefeller Foundation for a comprehensive research program on the physiology of the brain, to include an extension of the mobile clinic services throughout the State and a broad investigation of reading and speech problems in a large group of children. A grant of $60,000 was awarded for a two-year period with prospects of renewal thereafter. Unfortunately this extension did not materialize. However, over 1000 patients, mostly school-age children, had been seen by the traveling clinic during 1926–27 and a valuable part of the reading disability program was completed, including a six weeks' summer school at the Hospital. There various remedial techniques were tried

out with a group of children with specific reading problems and a diagnostic schedule of tests was formulated, the *Iota Test* among them.

Speech disorders had been studied throughout the research program. A speech therapist was a member of the clinical teams. Physiological studies of stutterers were carried on by Dr. Lee E. Travis and Dr. Orton with some successful applications to treatment.

Two years, obviously, was not long enough for much of a beginning in the basic research programs in neurophysiology, neuroanatomy, and cerebral dominance which Dr. Orton had planned. One project which he initiated, however, involved a year's study in a hospital laboratory in Holland which was carried out by Dr. Lauretta Bender in 1926.

Lauretta Bender had come to the University of Iowa as a third year medical student specifically to work with Dr. Orton because, she has said, "He was the outstanding neuropathologist in the country at that time." She became his top assistant in neuropathology at the Psychopathic Hospital and was one of his students in whom he had occasion to take great pride as he followed her eminent career in child psychiatry and research through later years. [Dr. Bender's account of her work with Dr. Orton appears in her paper in this issue of the *Bulletin*.—Ed.]

Following the cutting off of funds to continue his basic research in the brain functions underlying the language processes, and because of certain unrelated events at the University at that time, Dr. Orton resigned from the Psychopathic Hospital July 1, 1927. As a widower with three teen-age children, he spent the next year at the home of his brother in Columbus, Ohio, completing his research reports and looking into available professional opportunities for a "neuropathologist with a special interest in children's language disorders, and recent experience as a hospital director and a professor of psychiatry,"—and president-elect of the American Psychiatric Association. His decision was to go, in the fall of 1928, to New York City with his recent bride, the former June F. Lyday, as his psychological assistant and "Girl Friday," to open an office for the private practice of neuropsychiatry.

Time did not permit a review on this program of Dr. Orton's accomplishments during the following twenty years prior to his death on November 16, 1948, at the age of 69. Many who had worked with him in those years became members of *The Orton Society* founded in his memory and named in his honor in November, 1949; several were present at this 25th anniversary meeting. Some of the Orton Society members had known Dr. Orton through

his *Language Research Project* at the New York Neurological Institute (1932-36) where Dr. Paul C. Dozier was his research associate and Miss Anna Gillingham was the outstanding psychologist-teacher, or they had had personal consultations at his office for which he always seemed to find the time. Others probably met him only once or twice during his visits to schools or at the talks, lectures, seminars, etc., which filled his busy schedule, but they always remembered those special occasions.

The activity at Dr. Orton's office had soon required a second assistant there and the one who came along in 1939—and with a graduate degree in reading problems—was Mary Helen Robinson, who prepared the following reminiscences for this occasion.

Mary Helen Robinson:

The invitation from Roger Saunders to speak briefly tonight about my experiences working with Dr. and Mrs. Orton in New York in the early 1940's happened to arrive on my birthday. Since this particular birthday made me automatically a "Pre-Medicare Senior Citizen" at the local drug store prescription counter, Roger's charming words, "We feel that you can speak as a YOUNG person who gained insight and inspiration from his leadership in your field of education" really brightened my day! So I will try to Think Young tonight, and tell you how Dr. Orton, and June Orton and the Orton Society, beginning when I *was* young, have given me not only inspiration and leadership but a continual challenge to give of myself and my training no matter where I lived to help the language-disabled child find success, not failure, as a pattern for life.

My husband and I drove from Seattle to New York back in 1939. He was headed for graduate work at Columbia University, and I was headed for Dr. Orton's office, though Dr. Orton was definitely not expecting me! My own graduate work was in psychology at the University of Washington, specializing in the field of learning and language problems. An earlier summer spent working with Dr. Grace Fernald at UCLA with her program for non-readers had really steered me into this field. Why were intelligent children failing in the class-room, especially in language areas? I read Dr. Orton's book, *Reading, Writing and Speech Problems in Children* before going to New York and was excited by his theory relating specific language difficulties to a faulty pattern

in brain functioning, and his important conclusion that these children could be taught by an approach and methods specific to their needs. In other words, they needn't fail!

With high hopes I went right to the Ortons' office in the Croydon Hotel to see if they would let me work with them. Fortunately for me, their assistant was just leaving at that time, and I became a member not only of the office team, but of the Orton family. In their wonderful warm way, they included this young couple in many a weekend at Hwimsy, their rustic retreat near Poughkeepsie. Dr. Orton loved the outdoors and loved to work with his hands. He designed and built their home, complete with an outdoor swimming pond and strong enough for a bomb shelter. I include this bit of nostalgia because Dr. Orton was not only a brilliant pioneer in his profession but a builder-craftsman and a warm sympathetic human being, keenly aware and interested in everything and everyone.

Dr. Orton felt deeply the problems of each child, parent, teacher and headmaster who came to him for help. His quick mind, his vast experience, his understanding of the crippling blow that language disability deals to the image and self-confidence of the specific language disability child, all gave him the strength and inspiration to keep on with his research and his practice long after his own health was failing. He wanted to establish the clinical scientific basis for language disability; to promote understanding of its importance to the medical and educational professions; to create the educational procedures and materials necessary for these children based on sound neurological principles, and to train teachers—many parents who came to his office at that time with their children had no tutors available in their areas.

Dr. Orton taught me to respect the uniqueness of each child and to teach to his intellect; to have a sensitivity to children; to observe and learn from each child how he learns, what are his areas of strength and weakness; and then to plan the training with flexibility and creativity to meet his needs.

I'm sure that if Dr. Orton could be here tonight he would feel deep joy, not just for himself, but for the hundreds and thousands of children who have become solid, contributing, happy citizens through the touch of the Orton Society and its dedicated members all over the world. Those of us who are fortunate enough to have known him personally and to have watched the Society grow in strength and impact and influence over the past twenty-five years, hope that the future holds even brighter successes for all children. Tonight is a fitting tribute to a great man, and I'm proud to be here!

Mrs. Orton:

It is appropriate that these reminiscences should be closed by Paula Dozier Rome, because hers is a special link between past and present. As niece of Dr. Orton's friend and associate, Dr. Paul Dozier, she will tell you of how she came to know Dr. Orton. Her many years of successful experience in her Remedial Reading Center here in Rochester and her co-chairmanship of this 25th Anniversary Conference of the Orton Society, the World Congress on Dyslexia, attest at once her on-going interest in the work which Dr. Orton began and her role tonight as, in a very personal sense, our hostess for this occasion.

Paula Dozier Rome:

Mine is probably last on the list of memories because I suppose it was appropriate to have someone who had met Dr. Orton only a few times, late in his life, and yet one whose life was changed by the influence of knowing him and knowing of his work.

My uncle, Dr. Paul Dozier, who was a neuropsychiatrist, was Dr. Orton's research assistant at the Neurological Institute of Columbia University from 1932 to 1936. Then, on Dr. Orton's recommendation, he was appointed as head of the Language Disability Clinic of the Institute of the Pennsylvania Hospital in Philadelphia, which Mrs. Orton mentioned earlier. It was there that, as a student, I learned how to teach a child, using the techniques of teaching based on Dr. Orton's neurological concepts and amplified by the practical material in Anna Gillingham's manual.

When one day my uncle said, "I am going to New York to confer with Dr. Orton. Would you like to come with me?" you can imagine my excitement. I expected to meet an austere and distinguished professor, ensconced in a large, elegant office and barricaded by secretaries. It was so different! Instead, we walked into a wonderfully warm, crowded beehive of an office, lined, as I remember it, with a welter of office files. Dr. and Mrs. Orton were working busily in the midst of these. There was such an air of informality and warmth that anyone would have felt at home, as I am sure the children and parents who crossed the threshhold did.

During subsequent years, I had the delightful experience of being invited on two occasions to "Hwimsey," the Ortons' summer home. Although Dr.

Orton was, as it seemed to me, a quiet and retiring man, his warmth and concern for people was always evident. He was able to make me, the youngest member of the group, feel at ease.

He was a great man, devoted to his concern with helping those with language disability problems. His concepts, as he provided them to me through the printed word or at meetings, guided me toward devoting my professional life, also, to helping children with these problems.

I wish he were here to share this occasion!

Part II. Samuel T. Orton—Yesterday and Today

In Neurology

Richard L. Masland, M.D.

The stature of a great scientist may be measured by the energy with which others try either to defend or to find flaws in his theories. Now, almost fifty years after Dr. Orton wrote his first paper on strephosymbolia, there is still scarcely a major review on Reading Disability which fails to include some reference to his contributions. On one thing we can all agree—Dr. Orton's creative theory on Word-blindness has served as the stimulus for a whole fresh approach to our study of dyslexia and related reading disorders.

But I suspect that many people who write about Dr. Orton's theories may not have really studied what he has written. There is not much excuse for this, since the Orton Society by publishing his collected reprints has made it easy (Orton 1966).

Just to make sure that we are all thinking about the same theories, I should like to read you several key quotations, and emphasize especially some of Dr. Orton's later writings.

In 1928 Dr. Orton wrote:

> Since the visual spheres of the two halves of the brain are antitropic (i.e., right and left), we believe that visual engrams are registered there as antitropic pairs and that originally either is competent to become the guide for motor responses. The establishment of the physiological habit of initiating the more intricate motor responses, such as speech and writing, from the association area of one hemisphere alone, usually occurs early in childhood, but apparently at varying ages, and expresses itself outwardly in a preference for the right or left hand, as the case may be. This establishment of unilateral dominance presupposes the elision of the engrams of the other hemisphere at the associative level so that they no longer serve as a pattern for the motor responses of speech and writing. (Orton 1928)

In 1945 he reviewed his theories as follows:

> The theory was offered that the special reading disability which serves as a serious handicap to academic advancement *in many children*

may be exaplined as a failure in complete elision of memory records of the non-dominant hemisphere, and as a persistence therfore of two more or less equi-potential records. In other words, a physiological failure to establish the normal pattern of unilateral cerebral dominance in control of graphic language, reading, spelling and writing. To delimit this group of children with failures and delays in learning to read from those where *other* factors were operative the term "strephosymbolia" was suggested. (Orton 1945)

A very closely related thesis is embodied in the following quotation:

A far more basic and important feature of cerebral dominance seems to be the function of the dominant hemisphere as the central processing site of the brain. According to this concept, if dominance is not clearly established, there is no central point through which various cognitive acts are channeled—where their relative importance is ranked and proper commands for motor responses are programmed. In other words, this theory states that there must be a final cognitive path. One can easily imagine that the lack of a central processing and control system—especially for the subtle and fragile processes of language learning and reading—would lead to great confusion.

The problem of cerebral dominance is real and crucial. It now appears that the dominant hemisphere gathers information from all over the brain for the analysis of linguistic information.

The data suggest that in language-related behaviors—in particular, reading—there may be a direct and immediate need for the transfer of information between the cerebral hemispheres. One can begin to see that if this system is not operating normally, obvious deficits would result in both acquiring and utilizing reading skills. (Gazzaniga 1973)

What is interesting is that the above quotation, written in 1973 presents conclusions derived from important new data.

What are the additional data which support Gazzaniga's remarkable reaffirmation of Orton's thesis? Several might be cited:

In his writings, Orton makes no reference to those skills for which the *right* hemisphere is dominant. Subsequent studies have demonstrated that while the left hemisphere is dominant for temporal and language skills, the right hemisphere is superior in certain visual-spatial skills. Writing requires either the integration of these functions of the two hemispheres, or else a transfer of dominance for letter recognition from the right to the left hemisphere, further evidence for the potential for inter-hemisphere rivalry postulated by Orton.

In his theories, Orton noted that the images recorded in the two hemispheres were 'antitropic,' that is, mirror images, and that interhemispheric transfer could be expected to lead to letter reversals. Such reversals have been demonstrated experimentally in the pigeon by Mello (1966) and in the operated monkey by Nobel (1966).

Dr. Gazanniga's own work relates to studies of patients whose two hemispheres have been surgically separated by section of the corpus callosum. Within such patients there is demonstrated a remarkable ability of the "two brains" for independent thought, and much to indicate that normal functioning may involve considerable rivalry between the two hemispheres. One hemisphere is required to inhibit the other, and failure for this to occur could be a significant source of confusion and internal conflict.

Some indication that disorders of cerebral dominance may underlie reading disabilities may also be derived from studies by Denckla (1973) and Rudel (et al. 1974) of finger dexterity and Braille learning in boys and girls. What physiological difference may underlie this remarkable susceptibility of boys to reading disability? Their studies show definite differences between the sexes in the rate of development of cerebral dominance, and especially in the maturation of those skills requiring inter-hemispheric cooperation. These observations are supported by those of Symmes and Rapaport (1972) showing that dyslexic boys very frequently have superiority in certain right hemisphere skills.

One of Dr. Orton's important postulates, as quoted above states that: "Special reading disability .... in many children may be explained as a failure in complete elision of memory records of the non-dominant hemisphere and as a persistence therefore of two more or less equipotential records.." In this remarkable insight, Dr. Orton anticipated by more than forty years what now appears to be in the forefront of modern theory of brain function.

References

Denckla, M.B. 1973. Development of Speed in Successive Finger Movements in Normal Children. *Dev. Med. and Child Neurol.* 15:635–645.

Gazzaniga, M. S. 1973. Brain Theory and Minimal Brain Dysfunction. *Annals N. Y. Acad. Med.* 205:89-92.

Mello, N. K. 1966. Concerning the Inter-Hemispheric Transfer of Mirror Image Patterns in Pigeons. *Physiol. and Behav.* 1:293-300.

Noble, J. 1966. Mirror Images and the Forebrain Commissures of the Monkey. *Nature* 211:1263-1266.

Orton, J. L. ed. 1966. *"Word-Blindness" in School Children and other Papers on Strephosymbolia (Specific Language Disability–Dyslexia), 1925-1946, by Samuel Torrey Orton, M.D.* Towson, Maryland: The Orton Society.

Orton, S. T. 1928. Foreword. *Genetic Psychology Monographs. Mirror Image.*

——. 1945 Some Studies in Reading Disability. Paper given upon receiving honorary degree from the University of Pennsylvania.

Rudel, R.G., M. B. Denckla, and E. Spalton. 1974. The Functional Asymmetry of Braille Letter Learning in Normal Sighted Children. *Neurology* 24:733-738.

Symmes, J. S. and J. L. Rapaport. 1972. Unexpected Reading Failure. *Am. J. Orthopsychiat.* 42:1-91.

In Education

Margaret Byrd Rawson

Dr. Samuel Torrey Orton was that rare combination, a whole interdisciplinary team in himself. He was soundly schooled and practiced in his several scientific and medical fields, well-trained in research, a creative theorist, a practical engineer, a scholar, and, above all, a compassionate physician. In this last role he believed, and practiced, that the ultimate objective of understanding and diagnosis of the patient's plight is his treatment–alleviation of his distress and promotion of his positive health.

Since the focus of the last 20 years of Dr. Orton's life was on an academic learning problem, it was obvious to him that its treatment should be educational. It was no small part of his genius that he saw what the educational needs of his patients were; devised a basic plan for meeting them; enlisted the support of talented colleagues from several relevant professions; launched a project for developing the pedagogical methods and materials for teaching; and established successful programs in settings where they could be used with patients or students–in private practices, clinical facilities and schools.

He was convinced that strephosymbolic children (now often called dyslexic) were not defective, but were hampered by patterns of growth which were normal but different from teachers' expectations. This led to supposition that appropriate teaching would aid in these children's development into

capable students and adults. Their thought processes, he had found, were generally strong, but their rote memories played them false, specifically in matters of symbolic forms and sequences. It seemed to him that the obvious general answer was to reduce the amount to be memorized to the basic elements of the language and to teach these thoroughly, through all the participating senses. Then the learner would have dependable building materials with which to apprehend and transmit messages, using the rational processes of synthesis and analysis.

This involved painstaking care in devising materials of instruction planned to lead the learner from ignorance through rudimentary knowlege and practice to understanding competence. Orton called on educators to undertake this task, but he did not just say, "Here, *you* do it!" Instead, as one early worker, Margaret Stanger, recalls it, he turned onto the task his own very considerable scholarship and laboratory-trained mastery of detail. This met with answering enthusiasm and support in Anna Gillingham, the scholar, and others, and launched them into extended projects, from which issued the manuals and other materials and, hence, the still continuing development of new formulations, all deriving from the basic pedagogical premises.

But tools are of value as they are *used*. These instruments were tested and refined by teaching therapists working with individual children and young people in the practitioners' offices and clinics, and in schools. The schools, at first, were mostly independent ones, perhaps because it was from them that the children were often referred, and because such schools were freer to accept innovative ideas and practices. Cooperative arrangements were set up with many schools. Some of them have survived changing times, policies and personnel, and new ones have joined them. Increasingly, public schools, preventive programs and group adaptations of the original patterns of teaching have developed, the present period being one of rapid expansion.

Karl von Frisch has recently said, "If one is fortunate in finding capable students of whom many become permanent co-workers and friends, this is one of the most beautiful features of scientific work." Master-teacher and inspiring group leader that he was, Orton would no doubt have agreed heartily. He gave much time to nurturing understanding and practical competence of collaborators, whether they were medical colleagues, established teachers and psychologists, long-time trainees, or (like me) one- or two-time consultants. For all of us, he opened horizons and encouraged us to sail on to as yet undiscovered worlds. If he had not, I should not be here tonight, nor,

perhaps would most of you, thinking as we are of the thousands of young people already on their successful ways, and worrying about the millions still in need of help.

Orton nurtured his professional brain-child, found it viable, turned it loose, and would, I believe, be happy to see what a healthy, effective and still interdisciplinary-minded adult it has become.

The Orton Society, created to be its foster parent, has, while fulfilling this function, been happy also to keep green the memory of its natural parent, the great trail-blazing pioneer. He does not (like the Mendels of science) have to be re-discovered after decades of eclipse, but only to be re-emphasized and further appreciated as one after another of his prescient hypotheses is verified by current experimentation and as the successful teaching of the children and young people who were his major interest goes on. We are happy to have come together in celebration of the years of accelerating growth, and to share our full awareness of the challenge of the future.

References

Rawson, M. B. 1975 Dyslexia–educational treatment and results. In *Reading, Perception, and Language*, Drake D. Duane and Margaret Byrd Rawson, eds. Towson, Maryland: The Orton Society (paperback) and Baltimore: York Press (cloth).

von Frisch, K. 1974. Decoding the language of the bee. *Science* 185:663–338.

Samuel Torrey Orton

With brilliant tenacity, he sought solutions to the perplexities and the dilemmas posed by children who should but could not read. Seeking specific determinants and causes, he never lost sight of the total child. Hewing to a medical etiology, his remedial approaches were by and large educational. His voice, uncertainly and hesitantly heard in his day, rings clear and vibrant in ours.

DYSLEXIA INTERNATIONAL

World Congress on Dyslexia
November 1974, Rochester, Minnesota

Introduction

The long-standing international interests of many members of the Orton Society are reflected in its meetings and its publications. They have grown with the Society, through exchange visits of colleagues across oceans and international borders, and through an increase in the number and scope of papers presented at conferences and in our publications. What, then, could have been more fitting than to round out the first quarter-century of the Society's life by holding a World Congress on Dyslexia in cooperation with a world-renowned medical institution, the Mayo Clinic?

Unfortunately, some of our valued members and contributors in the forefront of representative disciplines from several countries were unable to be present. They were sorely missed. Nevertheless, the Congress was attended by about three-score distinguished members and guests from fourteen countries on five continents. The Orton Society in the United States of America was proud to be their host. Several of these participants had themselves been professionally active in two or more countries and continents; for example, C. K. Leong had lived and worked in China, Australia, and Canada; and John McLeod in Great Britain, Australia, the U.S.A., and Canada; and both had other international ties.

Two of the papers given at the Congress in the State-of-the-Arts series (which is being published as a book, *Reading, Perception and Language*) were from England, while other significant research papers published in this issue of the *Bulletin* were brought from Canada by Drs. Kline and Leong. The four "Dyslexia International" sessions and other activities gave opportunity for all to hear greetings and reports of scientific and educational activities in each of the countries from their representatives. We wish we could share all of each of these interesting talks with readers of the *Bulletin*, but space and availability of manuscripts limits us here to summaries of only a few of them. In addition to those so included, the large groups of closer neighbors from Canada were represented by Edith Gollan of that nation's capital, Ottawa; and by Dr. John McLeod of Saskatchewan; from Bermuda by Betty Kitson and Gervase

Marson; and from Puerto Rico by Lillian Strong—all with sparkle and enthusiasm shared by others of their three groups.

While we in the USA *knew* that all these people had come to us as distinguished guests, we *felt*, rather, that they were very much a part of the Society—well-loved relatives from overseas. That they were truly representatives of much larger numbers of their fellow countrymen, with whom we are now in closer touch, is attested by the reports they have sent us of the enthusiastic response "back home" to their lectures, reports, legislative participation, and educational consultations based on their experiences centered around the World Congress on Dyslexia. More and more we know that "It's the same the whole world over," and that "In union there is strength."

Here are a few highlights:

Australia

Margaret and Jeffrey White compared attitudes and provisions in Australia with those they had found elsewhere. They decided that, although activity in behalf of children with language difficulties had gotten off to a late and hesitant start, things are now humming Down Under. As everywhere, progress is uneven, but learning disabilities of many kinds, including dyslexia, have been receiving attention at an accelerated rate.

Elsie Smelt, of Victoria, an experienced teacher and writer, is so conversant with the nature of alphabetic languages that she can state their essence in the simplest terms we know: "Words are made of sounds. Sounds are written with letters in an orderly manner to impart meaning." She is also so esteemed that she is consulted at the highest federal levels. For instance, she has reported that since her return from the Congress she has used much of the material gathered there and elsewhere in the USA in an invited presentation to a Select Committee on Specific Learning Disabilities set up by Parliament to consider national legislation.

Local and regional associations have banded together from all quarters of the continent as SPELD (SPEcific Learning Disabilities). They have engaged in public education and legislative activities, bringing in speakers from abroad to large and enthusiastic audiences of professional and lay people. Several universities have been increasingly interested and are addressing themselves, in varying degrees, to research, teacher education, public information, and some provision of services to children. There are crying needs for educational treatment in Australia, as everywhere, with a few shining examples of how it

can be done. Interest in legislation is keen and growing. Communication, especially among professionals, is greatly aided by at least two journals, *Remedial Education*, published in Melbourne by the Australian Remedial Education Association, and *The Slow Learning Child*, published from the University of Queensland. The latter journal emphasizes mental retardation, but does not neglect other learning problems, including frequent papers on reading and dyslexia.

Australia may have "started lately" but her traditional dynamic energy is bringing her along at a rapid pace.

The United Kingdom and Ireland

The several speakers representing the British Dyslexia Association included its chairman, Lord Radnor, its honorary secretary, Marion Welchman, and several active professional investigators, writers, and teachers. Tim and Elaine Miles told of their situation in Wales and of their teaching and writing. Gillian Thomson spoke especially for Scotland. Helen Arkell, of London, showed her film and provided close connection with the Word Blind Institute in Denmark. Agnes Wolff not only gave further geographic link with diagnostic and treatment activities in England, but also kept vivid an early international connection with her mother's old friend and her own teacher of the early thirties, Anna Gillingham.

Marion Welchman has long been active as the executive secretary of the pioneer Bath Association for the Study of Dyslexia. She pointed out in her paper, "The British Story," that while 1896, with Hinshelwood, marked the beginning of the recognition of dyslexia in Britain, and Critchley and a very few others have been interested over the years, from the public point of view the idea lay fallow for seventy years. Then, beginning independently in Bath as recently as 1966, and in several other centers, awareness of need, provision for giving services to children and for preparing teachers for them, publication of the *Dyslexia Review* in Surrey, and attempts to secure appropriate legislation, all began to take hold.

Having started in each area to meet local needs, several well-developed associations came together to form the British Dyslexia Association in 1972. This organization in its turn has helped to found new associations and has been influential in having its concerns placed before both Houses of Parliament and various commissions and educational authorities. There have been popular interest and purposeful activity throughout England, Wales and

Scotland, and in a hands-across-the-border cooperation between the associations in the Irish Republic and Northern Ireland.

Opposition of education authorities and other bodies is found in the British Isles, just as it is elsewhere. In England the argument is open and sometimes acrimonious, but "at least the disputes have people talking about the idea." Everywhere, it seems, this period of the "contested idea" is the inevitable precursor to change and growth.

In Britain, too, there have been several privately-funded or university-backed agencies for diagnosis and educational treatment of dyslexics, for teacher education, and for research and public information.

During the past decade, the Bath Association and Dr. Macdonald Critchley have had especially strong and growing ties with the Orton Society and with the Scottish Rite Hospital Language Unit in Dallas, Texas. Other individuals and associations, too, have been developing similar ties with colleagues overseas.

Israel

Shifra Ben-Zvi gave an informative and moving account of the social and educational provisions made for Israeli children—services, teacher education, teaching materials, and research.

Perhaps the impetus for this effective activity comes in part from the fresh and relatively untrammeled start which the establishment of a new nation offers, but also there seems to be a combination of rationality, practical action, and caring which will take Israeli people a long way on the route which they say that they have still to travel.

Shifra Ben-Zvi gave in herself a particularly fine example of the warmth, concern, and effectiveness of the live-in-teacher-tutor relationship which the kibbutz way of life makes possible and natural.

South Africa

Edna Freinkel, of Germiston, South Africa, outlined interestingly and at some length the history of her nation and the growth of the Afrikaans language which shares with English the instruction in this bilingual country. She reported rapidly growing interest in all parts of the land, a few programs for teachers, especially in Cape Town, and limited public and private facilities

for helping dyslexic children. These special classes or tutorial services are only spottily available and vary in quality from rudimentary to excellent. However, awareness of need, interest, and activity are growing at an accelerating pace. So far, the provisions for nonwhite children and adults have been directed primarily toward the achievement of basic literacy in the population. In the white communities, where literacy is already general, Mrs. Freinkel sees greater readiness of the authorities to recognize and attempt to solve the problems of dyslexia.

Japan

Dr. Masaki Suzuki, Associate Professor of Pediatrics, Faculty of Medicine, University of Tokyo, reported that there have been very few papers on Japanese children with dyslexia, although such children are seen in medical practice. Most of the children Dr. Suzuki has seen have other symptoms associated with the language problem, symptoms suggestive of possible brain damage.

The universality of language phenomena and of human neurophysiologic variation being as they are, Dr. Suzuki questioned the extreme rarity (one percent) of dyslexia reported for Japan in the well-known study by Dr. Makita. Dyslexia not complicated by other conditions ("pure" or perhaps genetic dyslexia) exists but has been largely unrecognized, in his opinion, because it does not come to medical attention. Its presence would be rather unlikely to be discovered by the questionnaire method used in Makita's investigation. It would be more likely to be found if a more thorough case-finding study were made, using appropriate educational tests.

Dr. Suzuki explained that the Japanese writing system includes two kinds of script. There is Kanji which, like Chinese, is ideographic, with several thousand nonphonetic characters representing words or ideas. This system requires many years of diligent study and is fully mastered only by the highly educated.

The syllabic-phonetic scripts, Kana and Hirigana, on the other hand, have a limited repertoire of symbols which stand for spoken syllables, so that one can sound out passages almost as in an alphabetic language. These patterns are taught early and are mastered by most children at home and in the early grades with little difficulty. The regularity and dependability of the sound-symbol association simplify learning. The early start and the help of parents

who have strong cultural expectations that their children will read at least these language forms are probably facilitating factors, and a reluctance to admit failure probably serves to mask such dyslexia as does exist.

Although the language is generally regular, there are situations having to do with contractions and consonantal doubling which might be expected to be troublesome to dyslexic persons. These forms do, in fact, prove to be stumbling blocks. In Dr. Suzuki's opinion, the true incidence of dyslexia in Japan remains to be determined.

[We wonder, also, whether educational procedures developed over the centuries have not acted as a fine measure of dyslexia-prevention for mildly or moderately inept language learners. Japanese children customarily study aloud, speaking and hearing as they read and write. This seems almost exactly the multisensory approach found in the USA to be an effective program for preventing language learning problems in dyslexia-prone youngsters through Slingerland's classroom modification of the Orton-Gillingham way of teaching. Perhaps the Japanese just got there a few hundred years ahead of us! It would be interesting to compare results in other cultures with similar teaching patterns.—Ed.]

Germany

Dr. Edith Klasen, now of Munich, West Germany, grew up in Germany, received her education both there and in the United States, has spent ten of her twenty professional years in each country, and wrote and published her comprehensive *The Syndrome of Specific Dyslexia* simultaneously in English and German. She has written on dyslexia and on preschool education in Austria, Hungary, and Switzerland, and has studied these problems in other European countries. Truly at home on both continents, she is an informed observer of clinicians, teachers, parents, and children, and of the efforts of educational authorities, especially in Germany, to meet the needs posed by the problems of dyslexia. Because of the almost universal applicability of much that she has presented, several excerpts are given in this summary of her interesting paper, which we regret not being able to publish in full.

In her paper she calls attention to the fact that Germany's population equals that of New York, California, Illinois, Ohio, and Tennessee, all concentrated in an area the size of our state of Oregon. Germany's eleven states have independent school systems and legislation, with the federal government providing advisory and sometimes facilitative support. In this and other

respects she reports similarities between the two countries. She points to the influence of American and English professional thinking on German formulations as being greater in recent times than the reverse contribution, attributing at least part of this to the parochialism engendered by our rather exaggerated reliance on the literature of a single language. The Germans' greater fluency in English is reflected in the multilingual nature of their bibliographic reference lists.

She reports, in Germany, a confusion of nomenclature and administrative and pedagogical variations in classification and teaching, with which we also are familiar. If we believe that words influence thinking, which, in turn, is reflected in practice, nomenclature can indicate the state of the art in time and place, and so merits examination.

Dr. Klasen says, "The scientific discipline dealing with exceptionality is called Special Education in the States, Special Pedagogy in Germany, Curative Pedagogy in Switzerland, and Clinical or Orthopedagogy in the Netherlands. Comparative study, therefore, is relatively easy as long as we are concerned with the traditionally and internationally known exceptional categories, such as sensory, physical, speech, mental, and social handicaps [and including] giftedness.

"Matters are much more complex and complicated, though, when it comes to the disabled learner. . . . In Germany there are three related yet separate terms to be distinguished:

1. Learning Handicaps (*Lernbehinderungen*) [a euphemism for mental retardation].
2. Learning Difficulties (*Lernschwierigkeiten*) [equivalent in US parlance to underachievement, from whatever causes].
3. Learning Disorders (*Lernstörungen*)."

This last category includes Minimal Brain Damage or Dysfunction, which came on the German scene in the 40's, was emphasized in the 50's, and became known as Learning Disorders in the 60's. Whether the category includes or is wholly or partially separable from the one primarily concerned with language (and latterly arithmetical) learning still seems somewhat unclear in Germany, as elsewhere.

That such a category represents an important reality is reflected in the heading *Teilleistungswäche*, literally, "partial performance weakness" or, more broadly, "selective achievement deficits." What is called in many

European countries *legasthenia*, or "reading and writing weakness," and elsewhere is called dyslexia, is coming to be thought of as one form of learning disorder. The designation legasthenia leads to a grouping Lese-Rechtschreibschwäche, shortened to LRS. An improvement on the still-heard "partial mental deficiency," it is still a deficit-model rather than a difference-model of causation. Perhaps because of these differences of view, the lines of demarcation and methods of treatment vary.

Still, in the past quarter-century there has been a steady increase in publication and, since 1963, in educational provision under law—what seems to the clinician returning from abroad "a veritable dyslexia boom." Although not everywhere either uniform or sufficient, Dr. Klasen reports the following pattern of private and public educational provisions.

LRS children, identified by school psychologists or teachers, are provided for in four general ways (quite similar to those found in Czechoslovakia):

1. Individual help, generally through private tutoring, sometimes with concurrent psychotherapy and parental counseling. Qualified staff and clinic facilities are sufficient, however, to meet only a small part of the need.
2. Diagnostic and preventive teaching in the early grades by special teachers, with identification and referral to specialists in other fields as necessary.
3. Special groups:
   A. Within the child's regular classroom. Here the reliance is chiefly on the use of individually prescribed programmed materials.
   B. Separate classes for 12 to 15 children within the home school. These groups meet with the special teacher four to six times a week during school hours.
   C. Special supplementary classes to which students are transported after the close of their regular school day (which ends at midday).
4. Special "LRS Classes," often in different schools, which are, as we would say, "self-contained." Beginning in second grade, the teaching is more closely tailored to the individuals' needs and is enriched by music, dancing, movement therapy, even hydrotherapy, instead of traditional physical education. The curricular content generally parallels that of the child's regular school, to which he is expected to return by fifth grade, at the latest.

Says Dr. Klasen:

> It goes without saying that all of these organizational forms of special educational services have their drawbacks as well as their advantages. Children do not like to be singled out, to be labeled "LRS," to be transferred, to attend additional school hours, to adjust to complicated schedules. Still, as long as there are no better ways, these programs will continue and grow. Naturally, nothing can be arranged for any child by the school without parental consent. In some schools teachers work on their own time voluntarily with parents, either individually or in groups, either as counselors or as teachers, by offering information and materials for help at home, or simply for better understanding.

Intensive efforts are being made to attract qualified young people into undergraduate and graduate courses which prepare them more and more adequately for work as special teachers, psychologists, and counselors.

Teaching materials which conform to the realities of the German language are being developed rapidly in Germany and Austria. The general pedagogic principles, as would be expected, are as "international" as are the fundamental learning needs of children.

The procedures are individually planned and paced slowly enough for thorough mastery under the guidance of expert teachers. This builds, or after failure rebuilds, self-confidence and positive motivation. Strengths are capitalized upon, while in short, easy steps the areas of weakness are built up. At first, oral reading and writing to dictation--such important causes of panic and embarrassment to dyslexic children in German (and other European) classrooms--are minimized in favor of oral expression about interesting events and shared experiences. Faulty coordination and posture and other neuromuscular problems are given corrective attention through well-planned, pleasurable physical activities.

The lively, varied curriculum is designed "to improve motivation, interest, frustration tolerance, and attention span. . . . The whole teaching atmosphere is meant to be therapeutic, i.e., understanding and supportive, free of competition and grading, in short, 'encouragement centered.' "

Dr. Klasen closes her paper by saying:

> This overview is necessarily neither complete nor conclusive. Several factors contribute to the fact that nothing is handled uni-

formly in Germany. First of all, there is no federal department of education, each state having its own sovereignty in these matters. Guidelines are given by a federal body of ministers, but each state has its own legislation. Thus, educational programs differ widely. Secondly, especially in regard to dyslexia, knowledge, literature, materials, terms and methods, but especially recognition of the *needs*, have grown so rapidly that pioneer programs, experimental methods, scientifically designed models, and the like, were initiated in many places simultaneously, one not knowing about the other. The resulting diversity is not necessarily disadvantageous. It allows for flexibility, growth and adjustment, . . .

As all those who have worked with dyslexic children know, dyslexia is never a symptom by itself; it is always embedded in a personality with unique characteristics and a unique environmental background. Each child has 'his' dyslexia. The most important educational principle in our approach, therefore, must be the holistic, humane aspect. We treat not dyslexia but a child. And the most important didactic principle to me appears to be the individualization of all educational and therapeutic instruction. No nation has yet met the challenge fully. Much has been accomplished; more remains to be done.

Netherlands

Dr. Dirk Bakker of the Netherlands, a previous Orton Society conference participant and *Bulletin* contributor, summarized the present educational provisions of his country and reported on some of its recent significant research on dyslexia, as follows:

Holland has more than 175 special schools for children with specific learning disabilities. The country has about 13 million inhabitants. Thus the ratio of special schools to inhabitants is approximately one to 75 thousand. If located in the Netherlands a town like Minneapolis would have about 10 schools for dyslexic children.

These schools are found all over the country. The pupils, mostly boys of course, vary in age between 8 and 15 years. One of the latest developments is the specific high schools for learning-disturbed children. There are a few of them in our country. However, it is expected that more of these high schools will be founded in the near future. Having one or more children at a school for learning disorders is no financial burden for the parents. All costs are compensated by the federal government.

This short outline may indicate that the Dutch child with specific

learning problems is supported by both the citizens and government officials. So is research on learning and learning problems. . . .

A recent dissertation by Rispens at the University of Utrecht is entitled: "Auditory Aspects of Reading Retardation: An Investigation into the Relationhip between Auditory Discrimination, Auditory Analysis, Auditory Blending and Reading Retardation". For the examination of auditory discrimination a Dutch version of Wepman's test was administered. As to auditory analysis words were given; the subject had to name their component sounds in the right order. With auditory synthesis the reverse had to be done, word-composing sounds had to be blended into words. Poor and proficient readers from the first grade of normal elementary schools were compared. Auditory analysis and synthesis differentiated between groups, auditory discrimination did not. Within samples of retarded subjects from schools for learning-disabled children performances in analysis and synthesis were again significantly related to reading ability, while auditory discrimination was not. Applying factor analysis and stepwise regression analysis, Rispens was able to show that auditory analysis and synthesis relative to other variables are relevant factors in the enquiry into reading difficulties. Finally the author suggests that temporal order processing may underlie both auditory analysis and synthesis thus indicating that temporal order perception is a significant factor in reading and reading retardation.

This brings me to a project on the early diagnosis of reading disturbances, a joint effort of the Free University in Amsterdam and the Netherlands Institute of Preventive Medicine in Leyden. Tests of the perception of temporal order rank highly in this project. An article by Schroots, Van Alphen de Veer, Greenendaal, and myself will appear in the *Netherlands Journal of Psychology* early next year.

Some four hundred subjects from Kindergarten schools, aged 5–6 years, as many boys as girls from low, medium, and high socio-economic levels were administered two versions of a temporal order perception test. In the A version, subjects were given names of objects which they had to recall in the order of presentation. Immediately following the recall the subject was presented pictures of the objects previously mentioned.

Version B required the subject to point to the pictures in the order of the original auditory presentation. It will be clear that version B required inter-modal matching while version A did not. With both versions a homogenity-index of 75 was obtained. Split-half reliability coefficients were 80 for both versions.

Children of medium and high socio-economic levels performed sig-

nificantly better than children of the lowest level on both the A and B versions. Scores on the B version requiring inter-modal matching increased with age and tended to be better for girls than for boys.

A one-year follow-up examined the relation between temporal order tests A and B with various types of reading scores. Version A gave a range of 29 to 43 with reading tests and Version B ranging from 38 to 49.

Controlling for IQ reduced correlations to 14 to 23 for the A version and to 17 to 27 for the B version. All values are significant at at least the 5-percent level of confidence. The results of this study are in substantial agreement with those of a former study which is reported in my book on "Temporal Order in Disturbed Reading." It was concluded that temporal order processing, especially processes that require intermodal matching, account for a significant amount of the variance in reading performance of first grade elementary school children, and that temporal order perception is one of the basic factors in the initial learning-to-read process.

However, a major question is how to improve temporal order processing in early and retarded readers. An investigation on this problem was recently undertaken by Van Asten and co-workers of the Free University, Department of Education. Using training programs this project aims to help children with problems in the perception and processing of temporal sequences. Training in temporal order perception is done with the help of written and spoken words instead of nonverbal material like tapped-out patterns. Thus, during training the subjects are dealing with materials which they will have to master in order to improve their reading.

Work done at Tilburg University by Van Meel and Feltzer is closely related to the processing of information presented over time. Van Meel and co-workers feel that many learning-disturbed children have a preference for or even a pressure towards cognitive operations which, given a certain task, would do the job in the shortest possible time. Such a cognitive style may lead to numerous reading and writing errors. A first report of this research is to be found in a book entitled *Specific Reading Disability*. More recent studies in this area will soon be published in the earlier mentioned *Netherlands Journal of Psychology*.

Although I cannot mention all research on reading and dyslexia that is going on in the Netherlands, I must add that Nymegen University is busy with adapting in Dutch the Illinois Test of Psycho-Linguistic Abilities. It is felt by Dumont, the leader of the project, that this test is of value in the diagnosis of reading difficulties. Also, in Groningen, Prechtl, Kalverboer, and Bladergroen are continuing their studies on children with minimal brain damage and perceptual-motor deficits.

Finally, our work on lateralization-reading patterns: Two years ago in Seattle I told participants of the Orton Society Annual Meeting that these patterns in young and older school children seem to be quite different. In the last couple of years we have started new research in collaboration with Dr. Satz from the University of Florida and Dr. Van Duyne from Northern Illinois University. Results of recent research in this field support the conclusions presented in Seattle.

I am not familiar enough with the clinical remediation of dyslexia in my country to give a complete review, but I feel the need to end this short review of research with a tribute to the teachers of reading-disturbed children who, often fighting like terriers, try to make the dyslexic's life a little more comfortable. Researchers should feel obliged to support them with applicable information, if not today, then tomorrow.

Conclusion

It would be possible to fill an entire issue of this *Bulletin* with the reports brought to the World Congress on Dyslexia by colleagues from outside the borders of the USA. However, it seems to the editors that the greatest significance of the Congress is the demonstration of the very world wide nature of the common human problem of the mastery of language for thought and communication. It seems clear that, within all the countries we know about, there is similar variation in kinds and degrees of public and professional understanding and action. The spread of sophistication and involvement within any given country seems greater than any generalized national difference between it and any other culture.

Whatever the exact definition and incidence figures and the degree of public and professional acceptance, there seems to be no literate country without the phenomena of dyslexia. Sophisticated, statistically treated research data on its nature, treatment and achieved results has come in from Britain and Australia, several countries on the European continent, the Near East, Japan and China, Africa, India, and Latin America, as well as from Canada and the United States. Everywhere modifications are being made in education to meet the needs of otherwise able persons, young and old, who find it difficult to learn the skills of their mother tongues.

We like to say that we hold as a goal: to teach hi; language as it is to the child as he comes to us. We have, on the one hand, the universals of human structure and function, of the nature of language, and of the urge to personal

growth and its nurturing. On the other hand, we have first the differences in individual spoken languages, their basic writing systems and particular forms and, secondly, the almost infinite variety of capacities and limitations of individual learners. If we can come to terms effectively with these problems of unity in diversity, whatever our linguistic media of exchange, we shall by one more significant endeavor, advance the understanding on which to build that One World which is essential to the survival and fulfillment of us all.

TWO DYSLEXIC GIRLS GROW UP

Two moving autobiographical documents have recently come to us. They show such self-understanding and courage, and such capacity for interpreting the plight of the untreated adult dyslexic that we are eager to publish them. These young women, misunderstood and miserable in childhood, are still immeasurably handicapped in getting onto paper in legible and correctly spelled form the thoughts they formulate so clearly in spoken words, but they are eager to share their lives and feelings so that other people like themselves can be helped, and so that children such as they were can be spared the troubles they went through.

The Problem of Confidentiality. "Dyslexia," as one of our other subjects said, "is nothing to be ashamed of. It has happened to some of the best people! I don't mind being identified, if it will help." Yet, no one wants to be conspicuous.

Moreover, some of the adults, schools and communities in the lives of the young women who have entrusted us with their stories do not come through as understanding or helpful, to say the least. Still, the authors do not wish to embarrass them, for "they did the best *they* knew, wrong as they usually were about *me*."

And so, for obvious reasons, identifying information has been changed in these accounts, but changed as little as possible, to preserve the integrity of the stories.

The Unheard Cry—Help Me! A Plea to Teachers of Dyslexic Children

Phyllis Steingard and "Gail"

Villanova University
Villanova, Pennsylvania

From the first day I taught, I have always been perplexed by children who are very capable and yet have great difficulty learning. When I completed my undergraduate training, I had the wonderful misconception that teaching was very easy! All a teacher had to do was to love children, surround them with books, create an environment that would cater to their needs, interests and abilities, and then by some secret form of osmosis, they would learn. Of course, if they did not learn they were either retarded, culturally deprived, or their parents had created an "emotional block" which hampered their learning; therefore, we teachers were not responsible. I had absolutely no idea how really superficial the above labels were.

We were not trained to teach these children—children who have difficulty mastering concepts, children who have lags in their language development, children who have had few experiences, children who suffer from all types of emotional problems, or children who have lags in their neurological development. We were not told that we would be held accountable for these children. As teachers we have a legal responsibility to teach all children, but more important, we have a *moral* responsibility to teach all children. And so the story continues: we argue over terms, we place the blame outside our teaching, or we say these children are just "lazy," "stupid," "careless," or "spoiled."

The one group of children most confused in this muddle is the group that falls under the term "dyslexic." Every day we see beautiful, bright children who can't read, or write, or spell. Every day we see children who are excellent in all large muscle skill sports and yet they can't complete one writing paper in class. Every day we look into their puzzled eyes as they try to understand why they are experiencing these difficulties. We accept their existence and move forward by developing methods and materials which will enable these children to learn.

This summer I assigned the book *Can't Read, Can't Write, Can't Takl Too Good Either* by Louise Clarke, to students in my graduate course at Villanova University. It is the story of a dyslexic boy who graduated from Harvard University. One student in my class kept telling me that her sister experienced similar problems, but no one had ever told her why she had these difficulties. She asked me to talk to her sister, whom I shall call Gail, as she was very anxious to learn about dyslexic children.

Gail appears to be a tall, strong, intelligent, 30-year-old woman who is very much in command of her life. I was soon to discover that she is really a super-sensitive, soft, emotionally scarred, brilliant woman who is probably dyslexic. On an individual intelligence test she scored in the very superior range, yet she cannot spell correctly, or read a map, or (although she does read for pleasure) complete some reading assignments without the use of a slotted card as a place-marker. Gail was tested privately, evaluated and, received psychiatric care yet no one had told her that there was such a thing as a language learning disability.

As we talked and talked, I kept thinking--here sitting in front of me is a 30-year-old version of so many children I work with every day. How was I affecting my children? How would they feel twenty years from now? I asked Gail if she would describe her experiences in order to help us teach more effectively and with more sensitivity. She related various experiences to me. I have reproduced her thoughts, with her permission, exactly as she wrote them to me, with her spelling and punctuation.

> In first & second grade I cannot recall any details except trying to slide under my desk & banging my feet. What they were trying to teach me & how they were going about it I don't know. In third grade I had a teacher who was very warm & kind to me, she told me I'd learn to read & write she stated it as fact & spoke to my mother & me about me in a very positive way, she gave my mother a card with for roses on it, the first one a bud & other other showed its opening, sne told us it was me & I was the bud but soon I'd be the rose. Well with that kind of fath how could I miss. Between her & a tuter & the use of a slotter like the one you showed me in your letter I learned to read: The teacher would sit with me & hold my hand to gide my pincle & I learned to write or some factsimily. I never failed in her room & as I mentioned I even got a O [Outstanding] that year. I was so proud & began to relax, she & my tuter never pushed spelling except fenaticley my other subjects were OK.
>
> What I didn't know at the time was that the little card with the roses

was to furture me yrs later. I would see my mother sitting & crying as she looked at that card years latter & I knew I had hurt her more tham

---

I worked so hard & got no were I was told it was my fault. What my 3rd grade teacher d'd was rite & good she made me feel pride in myself. What she couldn't forsee was that my future teachers would compleatly dissregard what she said about educating me & they would take a firm stand on the fact that I was brite & therefore lazy. one thing all my el Ed. teachers did except 3rd gr. was to not allow me to do fun projects or projects I was intrested in because they said if I *wouldn't* do my work rite why should I be allowed to do extra projects. I was told if you were dumb we wouldn't expect anything better from you but you can do it & you will do it or no trips no assenbly no partys etc. This was done in front of my class, humelate the child & she'll do it they said, punish her & she'll do it. The only thing I did was try to kill myself in 7th gr & again in 10th.

These children need encurgement & understanding they cannot understand what they are doing rong, to them it looks fine & makes total sence. They must be shown there mistakes & have it explained that although it is *not there falt they* can solve the problems with help. That *you* know they are doing there best is so important to them & that other people yong & old have this problem is also *sooo* important It is so fritining to not understnad so much, when you understand so much, it's like warching & seeing & knowing but not being able to tuch. Any situation which they can't control becomes pure hell.

Because I was rong so often in school by the time I got to Jr. High I learned not to give what seemed the logacal answer, I would give the opsit one & that was rong to, what the hell I was so confused when I did get something rite I assumed it was dumb luck because I arrived at that answer the same as I did the rong one. It was so inconsistant & confusing I'd bee an A in one subject & flunk an easer on by High school I didn't try at all I did just enough to pass & spent most of my time reading. I escaped in books & if I could rember what I've read I'd be brillant today. Books weren't only for excape I was trying to find out what was rong with me.

There is no pattern in being Dixlexc the inconsisties are amizing, but even if there were a pattern I wouldn't be able to see it. I cannot follow a pattern that is printed & those that are living like doing something every week or just something that people repeat doing is a mystory to me.

Texboolk were hell I read & read and could not see what I was

reading, at this point I had forgotten about the slotter 8-12th gr. I'd outline & study & forget names dates & places. I still forget all the time yet there are things I can rember in such detail. In school & at home they said see she can rember what she wants. Gad now I wanted to rember everything. I couldn't even rember what days I went to the tuter or how to get there & I really liked him & my lessons, again a pattern I couldn't follow. I took my lessons in his home & I can still pitcher it. his wife & children were there & he would let me stop when I was tired & wartch TV with his family, he never hollared at me & I never spoke to his family (I was so shy) but I loved them all dearly. They were warm & kind to me something I would not exparance again for many yrs.

Gail's problem is one we see daily. I clearly remember a very bright first grader who had difficulty retaining some basic sight words. As I put some words on the board that I had taught for the past three or four days, I asked "Johnnie" to read the words. He looked up at the words, a big grin came over his face and he exclaimed, "You know, Mrs. Steingard, I'm just a fast forgetteror". We both laughed because that's exactly what he was—a fast "forgetteror." Without realizing that dyslexic children do forget sight words easily, we torment them for this difficulty. Gail relates her anguish at trying to retain simple spelling words.

My parents could never understand why at nite after hrs of studying my spelling & math would be OK then the next day I would flunk a test. The teachers said I didn't study, my parents said I didn't try & I never said anything because I didn't understand what was happening in this dame place. my anger was so intence & aimed at myself I was so smart I knew so much more than the other kids about so many things but I couldn't do the simplest task rite. Why Why You have *got* to understand this problem that will drive a child to the brink of insanity.

Gail relates another incident of the inability to master and to retain some skills.

There was a toy violin at the toy store that I wanted very much it cost about 5 dollor, quite a bite of money for a toy but I wanted it so bad that I naged and Naged until my mother said, if I got an A in the next test I took shed get it for me. I studyed like I never studyed and I got a B. she got me the violin becouse she knew that I really worked for

that B and as insentive to keep on working. The teacher on the other hand couldn't figuar out how I got that B and ask me to retake the test a few days latter, I of course had forgotten all the work by then and failed the test. she said I had cheated. I was afraid that my mother would take away the violin but she didn't she didn't understand why I flunked the test but she knew that I wouldn't cheat.

Many children possess mastery of gross motor movement, yet have little or no skill to master a simple writing assignment. This is a problem that Gail experienced. In her own words:

I was a tall child 5/7 by seventh grade, I could run and clime and make a hell of a lot of noise so no one could understand ov beleive that I could become exausted from writting a few lines or reading a few pages I cant explain the reason for this but I do know I was told that it was becouse I was lazy and stubbern, to this day and i read at least three books a week i cant read fore than fifteen menuert without risting my eyes and i cant rite more than 15 or 20 menuets without resting my hand, in school the pressures cut these times in half and try to explain to anyone why a big strong girl cant rite more than a few lines and then quit becouse she's tired and she hurts.

The cluttering effect in reading, as we know, can be eliminated by use of a slotter. Gail still uses a slotter for various activities.

I found I could not read the book you lent me, this happens with certain books & until now I have attributed it to the type set or the paper used. After three days of frustration over this book I realized now that I know the problem I should be able to find a solution for it. I took the book I had beem reading & started reading it trying to pay attention too what my reading habbits are & I found that I bend my books in half as I read, something I have done unconsiously for years when I tryed to read by book open I found I could not, there were too many words on it & they all ran together by placing a blank paper over the apposit page & one half way down the page I was reading, I could read The Shadow children with little difficulty.

Oh back to the slotter I learned to play majun about 3 yrs ago I used a slotter I had made for about a year the girls know me & accept my weard way of doing things. Not only that I always won. There are still some hands I cann'ot play

Bams	Graks	Dots	Bams
222	4444	666	8888

in 3 calors no matter how carful I am I get the colors or amount of mumbers rong.

The inconsistency of the performances of dyslexic pupils causes anger in teachers and parents and useless punishments for beleagured children.

In high school I had a histouy teacher who I really enjoyed she made history come alive for me current events suddenely had meaning and I couldn't get enough news papers and books to read. I still could not spell and all our tests were essa tests, dates slipped my mind and so did names but the facts were rite, my riting was ellegable and my tests were faileers but I was learning unfortinily no one new this but me and by this time even I wasnt so sure, there was a special recursh assignment to be given out I wanted that assign. very much when I asked her if I could have it she said "You can't even do regualer classroom work how the hell could youj ever do a special assinment like this/ Mabey she was rite.

The hurt that these children experience every day of their lives is not measurable. I asked Gail about her feelings. How does a bright child cope with these puzzling situations? I watch the children I work with and I wonder how they feel. Why? Why? Why? They are articulate, bright and have so many inconsistent, confusing problems.

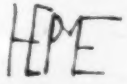
Gail, in her beautifully expressive style, describes her feelings.

I can't explain how I feel inside all my life I have been so humileated about school & so defeated in my academic efforts that until reading these books I could not dusscuss school in any aspect even with my husband.

I had so mamy problems as a child at home & in school that I hated life I hated mysilf I felt most of no all of my problems were phylologal I read every book on mentel disorders I could find over the yrs I have done enough recersh to get a PHD I started when I was about 14 & continud until about 25. I played games with my alalest's [analysts] (mamy of them) I knew all the tricks, I thought, but manley I couldn't let them hurt me as a child. My family said I was a cold rock no feelings no nothing. I would never show emotion I was a pro at hiding my feelings I

would not react in amy way to any situation I didn't laugh or cry until I was into my middle twentys. Sometimes I felt as though I would explode from within, I had so much hurt bottled up inside if only I could cry or scream. Sometimes I'de drive out to a forrest and sit perfictly still and constrate all my strenth on a tree I love trees "Trees are like animals caged inside a wooded box" Thats how I felt like an animal caged in a box. I'd lose myself and become part of that tree I grow and grew and became beautiful and like that tree I couldn't speak or feel and I'd find myself voike of all feelings and at peace.

Sometime in elementry school about 4th or 5th grade I started Putting a note on *all* my papers in the corner.



I continued this message until 11th gr. I was repramded over & over for doodling on my papers but no one ever ask me what it was, even though it was on all my work. I rote it by placing one letter on top of another open up is said HELP ME."

Gail was never encouraged to write in school. She couldn't spell adequately or her sentence structure was not correct. Yet all of us can now agree that we could easily read what she had to communicate to us. With all the errors Gail writes forcefully and without pretence. She communicates in her own way, better than some of us. The "help" she needs is for her spelling, not her spirit!

I Am Me!

"Louise Baker" (with Margaret B. Rawson)

"Scott isn't stupid. But it took a smart teacher to recognize it." Louise could not read the advertisement widely published by the Metropolitan Life Insurance Company in the interests of children with learning disabilities, but a friend said, "Hey, Lou! This sounds like you!"

Louise sent a letter to the company. Part of her letter looked like Fig. 1. She sent also the friend's translation of her letter in typed, correctly spelled form, saying, "knowing my penmanship, mirror imaging and spelling are hard to read." The words are her own, characteristically well-used.

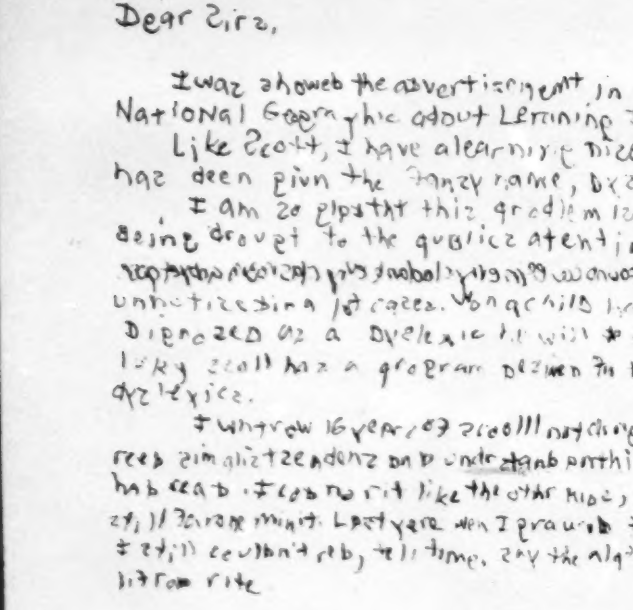


Fig. 1. Part of Louise Baker's first letter to Metropolitan Life Insurance Company, January 12, 1973. Note 2, reversed, appears to be 6; line 7 is written from right to left. See text for "translation."

Dear Sirs: Like Scott, I have a learning disability which has been given the fancy name of dyslexia.

I am so glad that this problem is finally being brought to the public's attention. This problem can be found in every school and every class and yet it goes unnoticed in a lot of cases. If a child has been diagnosed as dyslexic he will be extremely lucky if his school has a program for dyslexics. I went through 12 years of school not being able to read the simplest sentence and understand anything I had read. I couldn't write like the other kids, nor could I sit still for one minute. Last year when I graduated from high school I still couldn't read, tell time, say the alphabet, or tell left from right. . . .

I was lucky: someone [the next summer] took time to find out what was wrong. Too many children go undiagnosed and the school doesn't provide them with the proper attention.

I have written a report about myself and how I managed to go through school. . . . The report is in the process of being typed up. . . . I would be glad to send you a copy and would be pleased if you would be interested in reading it. . . .

Just as she was finishing high school, she had been discovered by a knowledgeable "specialist" who helped her to gain acceptance by a state university with exceptional understanding. She reported, " . . . They work with each student individually at the level at which he is. They provide tutors. These tutors are your friends; you can talk to them. These people are somebody who cares what happens to you and are interested in what you do, feel or say. . . . Take for example my writing. You remember what my penmanship was like before? They work you hard but the results are rewarding."* (Fig. 2.)

It was suggested that her paper be published, to which she replied:

I received your letter and it held some joyful news. I had thought of publication after so many people have read my report and suggested that such action be taken. [The paper had been circulated in the psychology class, at the teacher's request.] The types of magazines I prefer it to be published in are magazines concerning learning disabilities . . . or a maga-

*We have tried, directly and indirectly, to learn more about this program. Perhaps the people at the university fear an unmanageable inundation of applications. Of course, we must decline to identify the university unless they give permission.

Take for example my riting. Do you wonder what my penmanship was like before. They is work you heard but the results are rewarding. These people are exceptional people. They are even going to extend it into the summer and I have decided to go to the summer session.

I would be interested in your response to this letter. At last the people are begining to recognize this the [illegible] problem and demand something be done about it. I am pleased

Sincerely,

Fig. 2. From a letter written by Louise Baker on June 3, 1973.

> zine for teachers . . . this would help the specialist see the personal life of the dyslexic. [They] are the type of people who can alert the general public . . . [and the teachers] see these children every day. Maybe they will realize that the child is having difficulties in school.

The correspondence was then sent to us, and we were pleased that Louise wished us to be her first publisher. Her friends have corrected her paper and typed it for ease of reading, but the wording is hers, except for a bit of condensation at the end, which, like the rest of the manuscript of the article, has been given her inspection and approval. It has been a pleasure to work with her and we are glad to present her story to just the kind of readers she was looking for.

I Am Me

Louise Baker (pseudonym)

I believe in being prompt for all my engagements but on one occasion I exercised this virtue to an extreme. I decided to make my presence known to the outside world two weeks earlier than they expected. This caused a considerable amount of concern for several reasons. These being: (1) I weighed just a hair over five pounds; (2) my parents' blood was incompatible and this called for close observation; (3) I was two weeks premature. I have been informed on many occasions that the people working at the hospital were aware of my presence because my crying informed them!

I was what they call a "trying" baby. I cried almost constantly, stopping only because I cried myself to sleep or I had collapsed from exhaustion. I kept getting my head caught between the bars in the crib and as soon as a toy was placed in my crib I would throw it out. The only two toys I would allow to stay in there were my big teddy bear which I hid behind, and my little stuffed dog which I rubbed his ear while I sucked my thumb. I soon wore all the fuzz off his ear.

Rocking was a continuous pastime of mine. I rocked so hard and so long it finally resulted in the destruction of my crib. My mattress I had destroyed earlier by biting holes in the plastic covering and tearing the holes.

As a little kid I was a holy terror, constantly into anything and everything. I kept the house in one continuous turmoil by running, screaming, biting, kicking, stamping, crying, jumping, throwing things, breaking things, dropping and losing things, spilling, fighting, and just on the whole, noisy! I was a glob of perpetual motion and the source of constant upheaval. Needless to say, I wasn't easy to live with. For these things I was constantly punished. A good deal of the time I didn't know what I was being punished for. I didn't mean to do those things and sometimes I didn't even realize I was doing them. After I was punished, I retreated to my room, slammed the door, and bit my window sill. Yes, bit my window sill! To this day my teeth marks are still there, even after my father vigorously sanded it down. There they will remain as a constant reminder of the rage and the complete frustration, and the inability to understand and cope with the world I lived in.

Soon I started spending my weekends at my grandparents' house. This gave my parents a rest from me and it gave me a rest from them.

Now Grandpa was a very special person to me. He would have me help him in the garden and with any work that needed to be done around the yard. He even built me a "Lou size" wheelbarrow. He let me watch him make it. He used the left-over pieces from the boat he was building and the wheel came from an old tricycle. He let me help him paint it bright red. Then we would rake leaves and load up our wheelbarrows and cart them off. When our pile of leaves got big and we finished the work, he would throw me in the pile! He would then fish me out. Boy, did I love that!

There was a small shed attached to the back side of the barn. This was Grandpa's "smoking" room. This room was very sacred to Grandpa and nobody was allowed in it. He would disappear out there for a long time and then come back. Then he made an exception to his rule. I was then the only other person besides himself allowed in there. He made a kid-size rocking chair and painted it the same color as his chair. We would sit out there and he would rock in his chair and whittle on some wood, all the time puffing on his pipe. I would sit there and just rock. Sometimes we would talk about anything and everything. Other times we would be silent. I can remember of climbing up in his lap and leaning my head against his chest. I could hear his heart beating. When he talked or sang me a song it would rumble around deep inside. I guess he knew there was something wrong with me and that I needed extra attention. Grandpa was special. I loved him and he loved me.

By the age of six I was quite a handful. I was very moody and unpredictable. I still could not button my shirts right, tie my shoes, put my clothes on right side to, or even walk upstairs without falling down. My mother wouldn't take me with her when she went shopping because she couldn't control me. I was wild. I was a perfectly horrible kid and I couldn't help it. I ran my parents ragged. The only thing they knew to do was to punish me whenever I did anything. I aggravated my mother beyond belief and tried her patience to the greatest extreme. They didn't know what was wrong.

Twelve years later somebody finally took the time to ask the question, "Why was Lou having such a miserable time?" It was then that I found out that I was born with a type of minimal brain dysfunction—a learning disability called dyslexia.

Before I explain how dyslexia affected me in grade school and high

school, let me first inform you that during these twelve years we hadn't found out that I had this learning disability.

My year in first grade was an utter disaster. I was very hard to manage. I would stay in my seat for no more than a minute or two and then get up and run around, touch everything, and get into everything. Whispering and talking out of turn I did constantly and was punished for all these things by having to stand in the corner. I believe I spent more hours staring at the corner than at the blackboard! I remember while I stood in the corner the tears would roll down my cheeks and plop on my shoes or on the floor. I was a very unhappy little girl and felt so bad because I had done something to make my teacher mad and I hadn't meant to at all.

All during my grade school years I was forever falling over backwards in my chair, or dropping things, losing things, and forgetting things. I couldn't sit still for a minute. I would start on something and not finish it. My attention span was almost non-existent. I was constantly falling down, tripping even over things that weren't there and dropping my tray in the lunch room. I must say I kept the old school hopping.

My relationship with my peers was about like my attention span—non-existent. I couldn't keep friends worth beans and after awhile I got so I preferred being a loner. I had an occasion to tell my "friends" exactly where to go and their reply to me was with the same type of warmth. It always hurt my feelings when some of my classmates would have a birthday party and I was never invited to them. But I pretended I didn't care. I just didn't want them to know. I was always afraid they thought that I was stupid.

There was one game that the kids played that caused many a tear to flow and that was when one kid who had accidentally brushed against me or touched me or touched something of mine would immediately run to one of his friends as if it was a matter of life and death and tap him and say, "Lou's lice, I quit." How I hated that. What was it about me that made them dislike me and tease me and torment me? Why couldn't I get them to like me? Why was I so different? Was I funny looking; was I strange or odd? Why aren't I like them? These questions I asked myself a countless number of times and I found no answers.

Academically I was having severe troubles and nobody knew it. My spelling and math were always troublesome areas and my reading was a disaster. My penmanship was such a mess and disorganized that it was illegible. I was always placed in the lower section of my class. I was in the

remedial reading class and I worked in the SRA workbox. This SRA is arranged by colors according to the different levels of difficulty. The first level was orange and the three years that I was in this SRA I never advanced beyond orange. Nobody noticed I couldn't read and nobody asked why.

Each quarter when the rank cards came home there would be a letter from my remedial reading teacher. Each letter said basically the same things: "Louise needs to put more effort into her work. She is easily frustrated and hyper-emotional and hyper-sensitive. She does not accept criticism gracefully! She needs to budget her time better. She needs to pay attention more and stop daydreaming. She is very distractive and her behavior leaves much to be desired at times. She does not follow directions. Her main problem is in reading and math. Louise is capable of doing better."

Of course I was capable of doing better. Why not ask the question, "Why isn't she doing better?" or "Why doesn't she pay attention?" or, better still, "Why is Lou having a difficult time?" It sure would have been more beneficial for me and for everybody affected by me.

I can remember getting shakings for speaking out of turn and getting out of my seat and once just because I had smudges on my paper and letters written over or crossed out instead of erased.

Once I tipped over backwards in my chair and the class laughed at me and it made me mad, but I laughed so that they wouldn't know it bothered me. I got slapped across the face by the teacher "for being a show off and a clown." The kids in the class sat there dead silent. I could feel their eyes staring at me but I didn't dare to look at them. I just sat there and stared at my desk and I could feel the fiery tears on my cheeks. I slipped into my fantasy world. The classroom and its sounds were oblivious to me and could not invade the fantasy world I created. I was safe for awhile.

This is how life in grade school went. I wasn't aware of it when I tapped my feet, or tipped back in my chair, or did those little things that annoy everybody so. I did them unconsciously. But they didn't understand that. They devised one method which they believed would remind me; every time I did something they would have me write a sentence one hundred times. For example: one time I was caught tapping my feet. So I had to write, "I will not tap my feet in class" one hundred times. In math class I could not remember the commutative, associative, and distributive laws for addition and multiplication. So I had to write the commutative law for addition 500 times, the commutative law for multiplication 500 times, the associative law

for addition 500 times, the associative law for multiplication 500 times, and the distributive law 500 times. This was totally absurd because I never finished it.

But there were two things in school that I really loved and they were physical education and music.

We had music once a week. This was one area I excelled in. My teachers always tried to talk my parents into letting me learn to play a new instrument and take lessons at the school but we couldn't afford it. But in music class we would sing songs and when we put on a musical play I got the girl's leading part because she had several solo songs and they said I had the voice for it. My first successful accomplishment in school!

Physical education also was once a week. About an hour before we were to go into the gym I would go bananas. Boy, all day long I would be so excited I could hardly contain myself. The poor teacher could not control me well and even less so when I got in the gym! When I got in the gym I went *totally* bananas! I would race and tear around there as if the devil himself was at my heels. I usually got sat on the bleachers for disciplinary reasons a couple times during our gym time, which was sheer torture to me and as soon as the teacher would let my back out there I would start all over again. I would run and run and run and jump and holler. When we did the exercises I did them vigorously. When we played the games I played them just as hard as I could. I was wild. I just couldn't stop. I couldn't retain myself. I had so much energy (much to my teacher's distress)! But I was happy in there. I was free! I was like a caged animal that had just been granted its freedom. I was happy in there.

There is only one other substantial phenomena that occurred in my elementary school years that I would like to cover before I start on how I survived the traumatic experience of high school. And this has to do with oral reading. Now, if you look back at your school years I'm sure you will recall having to read out loud when called upon to do so by the teacher. This is all fine and dandy for the person who is a good reader. But, what about the person who can just barely read? My experience with this is typical of what happens in an everyday classroom. I was very seldom called on to read out loud; this didn't phase me a particle either way. When I was selected to read out loud I would try my best but all I could do was struggle to recognize one word at a time. After I had mutilated the first couple of sentences the teacher would politely ask me to sit down. After all, who likes to listen to a poor reader when there are good readers available? What kid wants to get up in

front of his class and feel humiliated and think of himself as stupid? I always felt like I was a quirk on exhibition. I would always return to my desk and sink way down in my seat and wish I was Jeanie on the TV show "I Dream of Jeanie" and be able to disappear.

In the eighth grade we had a graduation ceremony. Most of the girls cried because they were leaving the school they had attended for eight years. I thought it was rather comical myself. I was leaning toward the joyful side because this meant that I only had four more years of school to go.

I've often wondered if the teachers in that school realized that they graduated a kid from the school that couldn't read even a simple paragraph or write properly without getting some letters backwards. Did they realize that the kid also couldn't say the alphabet, or tell left from right, or button things right, or tie up shoes without it being tedious work? Did they realize that they graduated a child from that school who couldn't name the days of the week, or name the months of the year, or tell time? This kid couldn't even tell if she had her clothes on inside out or [illegible]side to or if her shoes were on the right feet or if her socks matched! Did they realize that this kid who went to their school for eight years had a real learning disability? Furthermore, did they care?

And so I proceeded on to high school.

You've probably been wondering how a person like this could ever make it through high school. Well, I graduated from high school and it only took me the regular four years! Some subjects, needless to say, I just barely skinned by in and some subjects I did surprisingly well in, such as biology, chemistry, and physics. Yet the methods I employed to survive this era of education were original, though not particularly honorable.

When an assignment which involved reading was given I didn't do it. How I managed to get by with this is I would listen to what the kids said about that particular subject and remembered those bits and pieces and listened to what was said in class so that I could get by adequately. Most of the time when I was asked if I had read the assignment I would lie and say I had, and sometimes I admitted I hadn't done the reading. This was most generally frowned upon, but was never investigated.

High school is where a person first learns how to write a term paper or a research paper or compose a theme. I devised a way to get around this. I wrote my papers, but then I had two friends who took turns rewriting my paper or typing it. Very seldom did any of my teachers see a sample of my own handwriting; in fact, some never have. They saw either someone else's or

saw typewritten papers. Without these two friends, I never would have made it through high school.

The tests most generally used were the standardized tests and required only marking a box. The only trouble with this is that I got the boxes all confused.

Multiple choice, matching, and fill in the blanks are the most commonly used tests because they are so much easier to correct. The way I went about one of these tests is I would find a word in the question that I knew. Then I would investiage the choices of answers and if any that I could recognize related to some word in the question, then I would mark it. Or, if the answers had been lettered and I felt one letter hadn't been marked for awhile, then I would mark it! Sometimes we had short answers, but my penmanship was illegible. I could not pass a test for the single reason that I could not read the test.

I failed test after test and soon lost interest. The teachers always said, "You get out of school what you put into it." Well, that isn't totally so. I put a great deal of effort into my work and received failing or just barely passing marks in return.

We received warning slips if we were in danger of failing a subject. I always received these and the contents were always the same. "Lou is not putting enough effort into her work. She does not complete her assignments in class. She needs to put more time into her studying. Lou needs to settle down more and improve her attention. We suggest more studying. She is capable of doing better. At the present time she is in danger of failing."

My mother would always tape these up on the wall in front of my desk at home in hopes that it would make me realize that I had better improve my studying or else! To me, they were a form of torture. How I hated school!

I devised all sorts of methods of cheating and most of them were successful. They failed on me only a couple of times. I paid dearly for it at the time, and I am still paying for it because I had cheated myself out of learning that material.

In Physical Science, Biology, Physics, and Chemistry I did surprisingly well. In all of these I had a "B" average. All four of these had laboratories, and again I employed my originality and came up with a technique to get by with a passing mark. In the labs we had partners. I set up the apparatus while my partner read the instructions. I had severe problems with the measuring of the various substances and absolutely could not make the graphs. I had somebody (one of my two friends) write up my lab after I provided them with the

information and my own conclusions. These lab reports most generally were typed out. I loved the sciences and I worked extra hard at them. Very often I worked in the lab during my spare time to try out my own ideas and theories. Some turned out to be ingenious and others disastrous! But the thing is, once I learned the principle behind the laboratories, I could then see how we utilized the principles in everyday living.

I most generally took an active part in our class discussions over the area of concentration. My teacher was impressed with my theories, observations, comments, and inquiries. I could not pass the tests, but my other work offset those marks by far.

The only major trouble I ran into in the labs was, I kept breaking test tubes, petri dishes, and anything else of breakable material. I also pulled the intelligent stunt of putting the hose of my Bunsen burner on the water nozzle instead of the gas nozzle. When I turned the knob to what I thought was the gas line, water started bubbling out of my Bunsen burner! This caused even the intellectual students to submit to hysterics. Since none of the other students could reply to the instructor's frantic inquiries, he immediately presented himself to the cause of the commotion. I was still standing there rather dumbfounded and had not been able to motivate myself to shut the water off. The instructor's face was that of complete surprise and utter disbelief. I gingerly reached out and shut the water off and managed to muster up a sickly grin. My grin immediately fell off as he vocalized his reaction, "Ugh! Lou, how could you?" Then he replied with an implication of humor, "I take it back, only you could do something like this!" I was not chastised severely for this. For obvious reasons my Bunsen burner's flame burned in an erratic manner.

Obviously I was not known for my academic abilities. I had earned myself a name in the sports field. My achievements in this area were what kept me alive in school. I received an award for being the most valuable player in basketball and softball. I was the second highest scorer on the four position rifle team, the vice-president of the Ski Club and the Rifle Club. I was presented an award for being the most physically fit girl in our school and I got another award for being the most athletic girl in our school. I was successful in this field in spite of my clumsiness. I worked *hard* at sports skills. I *had* to, but it got results!

There was one other area I was successful in and that was theatre. I had a part in the senior play. Our director gave me my script in the summer and I had a friend of mine read all the play into a tape recorder and leave it blank

where my lines were. Then I played the tape and spoke my lines where the spaces were. This is how I learned my lines. When we put on the play I was the first person in our school's history to receive a standing ovation in the middle of an act! I was presented the best player award, my second success in high school. I believe, no I know, I was the happiest person alive when the audience gave our play cast such hearty applause at the curtain calls. My parents were among them. They stood out because they were beaming all over. They were proud of me. For the first time I had done something that made them proud. That's all I wanted.

My senior year was the best year academically; the reason behind this being that this was the first year our school system had electives. I chose subjects that were workshops or laboratories, and therefore my grades were increasingly better. If these subjects required any reading, I couldn't do it but my projects and laboratories were what was graded—not my ability (or lack of) to read or write.

Although my academic ability improved, my behavior record did not. During these four years I received several detentions, numerous lectures, infinite reprimands in class and some disciplinary actions which resulted in expulsion from school. Needless to say, my disrelish of school increased. Yet I was obsessed with the idea that I was going on to college and become a physical education teacher. Even after the sulphurous bout I had had in school, I still wanted to go on to school. I wanted to learn; I was starving from lack of information. I couldn't let all of the past stop me at this point.

I got accepted at the State University by some miracle. I couldn't believe it. Yet I knew I wouldn't make it because I still couldn't read. I didn't know people up there who could rewrite my papers. I knew darned well I would flunk out the first semester but I wanted to try at least. Still I knew what the consequences would be—another failure to add to my collection.

By then a little light came shimmering down and penetrated my faded and somewhat withdrawn world.

In June I began living with a family I'll call the Smiths. These people altruistically opened up their hearts and gave me a home when I needed a home.

Dr. Smith is a Youth Education Specialist and he tested me. The results were not unforeseen to Dr. Smith, who told me that I had a minimal brain dysfunction—a learning disability he called dyslexia. At first the thought of being a "disability" rather joggled my mind, but then as Dr. Smith explained it to me I could see the pieces of the perplexed puzzle fitting together.

No longer did I have to hide from the problem. No longer did I have to fake and bluff my way around. I soon realized that this is something that I must learn to live with, not fight against. But, most of all, I realized that I didn't have to be ashamed of being me anymore.

I am going to college. I've accepted the fact that it will take me at least a couple of extra years to finish college and I plan to do just that. My academic goal is set. Now I shall strive and reach it.

Although I have grown and changed and become more competent in many ways, I am still the same basically dyslexic person I have always been. My daily life is still full of mix-ups. There is *real* "spilt milk" which I no longer cry over. I do some "talking backwards" like, "He's at the sas gation tanking up his car." My printing, while it goes faster, is still full of reversed letters, while my handwriting is much better but slow and tiring; my spelling is just hopeless! Sometimes I get terribly confused when there is a lot of talking or other noise and have to retreat to my room, whether people understand my leaving them or not. I read very slowly and inaccurately, but I get through a lot of books with better understanding than you would think. I am still hyperactive, but medication slows me down. I am often confused about time, place, directions, and the names of people and objects. I don't have any trouble, as you can see from this paper, in knowing what I want to say and how to say it, except that I sometimes have to hunt around for just the right word.

They tell me these traits are very common characteristics of extremely dyslexic people. We are not stupid; we just have to learn some things in a different manner. Now I have learned to cope with some of my difficulties and to live with myself, and that has made all the difference!

What is it like to be a dyslexic? I have tried to tell you just a small part of it, of how I have lived and how I feel. This is how I sum myself up in verse:

I Am Me

I am me.
That's plain to see.
For who else can I be?
I may not be able to write like you
But after all, I am me
Not you.

I know I can't read the way I should
But I'd give all my money
If I only could.
I can now say the alphabet without mistake.
I've never been able to
Previous to this date.
I may break things and drop things
When it's not at all possible!
I forget things and lose things
And spill something awful!
I have all kinds of energy
More than enough.
And my room is filled with collected stuff!
I have made small accomplishments
But they are big ones for me,
'Cause for once in my life, I am proud of me.

And well she may be!

Since this autobiography was written, Louise has married a fellow student with whom she is very happy. "Jack," she says in August 1975, "is very understanding of all my troubles. He even reads all my mail to me. . . . Also, I really enjoy being a wife. I love cooking. I'm still at the experimental stage and I've burned a couple of meals. Tonight Jack's parents are coming over for supper ['fro super,' in her orthography]. Jack and I both like a clean and neat house, so that keeps me busy."

The young people are still in college, where Louise has found several understanding professors who seem less interested in what she can *not* do than in what she *can* do. Sometimes her writing and spelling are vastly improved, while sometimes her clear manuscript hand serves to make plainer than ever, now that one can read it, how tremendously difficult for her the orientation and sequencing of letters still are. (A sample written in January 1975 is shown below.)

As we look over her life so far with her, and marvel at the resilience, courage and personal strength with which she has "made positive use of negative experience" we think not only of the time, effort and caring of the friends who have helped her through, and the therapy of Dr. Smith's frank diagnosis, but particularly of her loving grandfather. Her strength has come

Fall zemster iz ovr. My grades are as
follows - Math - A, Reading - B, Zocolgy - B,
Art - C. Im plezed with them all except
art. In reading Mr. [redacted] gave me my rank
Based on effort I still reab Grounds 3rd grade
level.

I start echol agen Jan 20th. Im ready
to start agan.

Thank you for making me a member of the
Orton Zocity. If there iz any thing I can help
let me kow.

I hope you Chriztmaz was Beautful.
and I dope you remberd the true meaning of
Chriztmaz.

Fig. 3. Excerpts from a letter from Louise to the editor, Jan. 9, 1975.

from many sources, but perhaps it was his imaginative caring which gave her the sense of basic trust, acceptance and freedom to be herself which has helped her to weather the storms and achieve a clear sense of her identity so that, in spite of everything, she can say triumphantly:

I AM ME!

REVIEWS

Reviews by Alice A. Koontz and Margaret B. Rawson, and by guest reviewers Carl L. Kline and Carol L. Kline.

Conceptual Blockbusting. by James L. Adams. Stanford, California: Stanford Alumni Assn. A volume in The Portable Stanford. 1974.

Conceptual Blockbusting is a delightful and challenging book about an aspect of thinking which the author says is too seldom given direct and purposeful attention. As director of the Stanford University's School of Engineering Design Division, the author is involved mostly with people whose approaches to problems are "analytic, quantitative, verbal and logical"; he is especially concerned here with tapping the free-wheeling capacity to form, re-form and combine new concepts creatively. The culture and training which characterize intellectual, technological society, so valuable in themselves, can be made richer and more effective if liberated by fresh, free approaches to conceptual variation.

With verve, humor, and originality, and with suggestions for giving oneself new experiences in monitored creative thinking, Adams discusses the blocks most of us encounter in conceptualizing. Some of these have their origin in perception—in failure to define a problem, to see it broadly, without being bounded by stereotyped or habitual preconceptions or by limiting one's full sensory awareness. Then there are cultural and environmental blocks so pervasive we are often unaware of them; and emotional blocks—fear of freedom to change, act, and accept, to imagine and to wait for ideas to "hatch." Intellectual and expressive blocks are often based in inadequacies of language, but there are language aspects in all the areas of concept formation.

When it comes to "block *busting*," many of the processes involve deliberate conscious approaches. Others demand thinking in alternative modes, say the use of visual or other senses if one is generally too ready with words. Tapping into the unconscious, using the insights of Freud, Maslow, and Barron, can free up powers of conceptualizing we literally didn't know we had. Adams' brief discussion of Ornstein (see below) and the values of integrating the "left and right, Western and Eastern" modes of mental functioning point back to what Adams has already done in this fascinating, challenging little volume. It will put you on your creative toes and fill you with excited delight. It will help make you an insightful clinician and a vivid, resourceful personal companion for your students.

—*M.B.R.*

The Psychology of Consciousness, by Robert E. Ornstein. San Francisco: W.H. Freeman & Co. 1972.

The Nature of Human Consciousness: A Book of Readings, by Robert E. Ornstein, ed. New York: Viking Press. 1973.

Ornstein (see Adams review, above, and Ornstein's "Right and Left Thinking," in *Psychology Today*, 6:12, 86–92, May 1973) is writing from the outer fringes where blow some of the most refreshing winds of modern psychology, as it seems to this reviewer. Longtime readers of the *Bulletin of the Orton Society* will recall numerous papers, reprints, and reviews, going back at least to Volume 14, 1964, treating the subject of hemispheric specialization in the brain. The names of Subirana and Benton, emphasizing the left and the right, respectively, and of Sperry, Masland, Geschwind, Gazzaniga, Lennenberg, Sladen, Duane, and others come to mind. (See the *Bulletin's Cumulative Index* for references.) Many of these scientists, and Dr. Orton, too, in the 1920's, first speculated on the possibly different functions of the *non*language hemisphere as well as those of the formerly called "dominant" hemisphere. More recently they have been reporting specific findings relating to the contributions of the half of our brains once thought to be not only silent but relatively unimportant to our higher mental functions. One could hardly study that bilateral genius and superlative conceptualizer of all times, Leonardo da Vinci, without speculating, as I have done amateurishly for years, about the nature of his two-sided mental resources and how he tapped into them, successively or simultaneously.

The secrets, we feel as we read Ornstein and those about whom he writes, are opening up. Perhaps there is a philosophic parallel to be drawn with the quantum leap in physics from Newton to Einstein. The new, holistic concepts both went beyond Newton and yet included his concepts and their applications which are at the roots of modern technology. Similarly, there is the prospect that the logical, verbal, linear, time- and space-oriented Western culture (the "language hemisphere" specialization) can be deliberately brought into cooperation with the aesthetic, mystical, wordless, to us "esoteric" knowledge, with its quite different concepts of space and time, the Eastern orientation, apparently seated in the other hemisphere. The result should be a kind of human functioning of the whole which would include both its parts but would be of a different order than either and more than their sum in kind and in richness. These books of Ornstein's, and the ones they lead us to, open the doors to that unimaginably limitless world.

Most of the ideas brought together by this prime "conceptual block-

buster" (see again Adams, above) are not new; some are as old as the ancient cultural traditions and their classic literature, and perhaps as old as humanity itself. Still, what is coming out now has a new element—modern brain science—and permits a new synthesis, an act of psychological and philosophic creation based in the reality of the objective world, as well as the convictions of personal experience and philosophic speculation of philosophers.

That Ornstein, himself, takes full advantage of the Word is obvious. He reads and observes and thinks verbally, as is apparent in all that he writes so well. *The Nature of Human Consciousness,* with its readings from the psychologists and philosophers of both worlds, brings to attention what has already been written by others in modern times. He begins with William James, who, like giants we have known in other fields, foresaw much of what is now being verified in the modern idiom. He includes such current psychologists, social scientists, and neurologists as Cantril, Polanyi, Deikman, Gazzaniga, Bogen, Dorothy Lee, Whorf, Jung, and many others. Names less familiar to most of us, like Lama Govinda and Idries Shah, put into words some part of the largely wordless "esoteric" experience. Some papers make a very good beginning indeed toward a synthesis of the two modes of being.

The Psychology of Consciousness is the author's own more inclusive explanation. The cover of the paperback edition tells much of the story. It pictures a model of the brain hemispheres showing a mathematician lecturing, a student at his books, a writer, a chemist, and symbols suitable to their conscious modes of thought all in the left hemisphere. On the other side are a potter, a sculptor, dreamers, a beautiful woman, one who is perhaps a seeress, and a few esoteric symbols. There is, too, a little man bridging the two, perhaps bringing a star to the "West" and a compass to the "East."

But after we have heard Ornstein out on the two modes of consciousness (are only two possible, one wonders, or could a *whole* mind conceive others now undreamed of—a sort of Blakeian "Mind of God"?), there comes a word of warning. We should not distort our new insight into ourselves by intellectualizing it all in words, engulfing the esoteric in the rational, as we in the West would incline to do. Neither should we abandon the Western mode by fleeing into the mystical as some anti-intellectuals do. We should, and can, have in ourselves the best of both worlds in a synthesis of complementary opposites.

And, who knows, the constitutional pattern which shows up in our largely verbal world as a "language disability" may, in the person of "the gifted dyslexic" with his *different* but not inferior cast of mind, come to the

fore. He (and she, of course) may have just the needed mix of creative freedom and flexibility to liberate us all—*vide* Einstein, Rodin, Leonardo and their legions of lesser counterparts. What an exciting vision and responsibility, for each of us and for the young people we work with—a grand objective for Project Liberation.

—*M.B.R.*

Mind and Brain: A Philosophy of Science. Arturo Rosenblueth. Cambridge, Massachusetts: MIT Press. 1970.

A succinct (115 pages), superbly reasoned statement of the concepts and methods used by scientists in the pursuit of an answer to the mind-brain problem. On the way Rosenblueth justifies his faith in the principles of physics and in their light considers neurophysiological organization, sensation, perception, volition, the nature of human knowledge, and the generation of new ideas. He denies the existence of two minds, one of them "unconscious," admitting only *degrees* of awareness. (Herein lies his explanation of the "split-brain" findings.) On the other hand, every mental event, he believes, does have its physical concomitant. The two exist in parallel, each reflecting, but neither determining the other in what he calls a dualistic philosophy with "two monistic assumptions . . . the first mentalizes matter and the second materializes mind, insofar as its determinism is concerned." "The only determinism [he accepts] is that of physics." "If any adequately proved events should be found to be outside of physical knowledge"—and he knows of none so far—"physics would have to be modified to accept them." He leaves us much closer to a solution but leaves us feeling still unsure that the last word has been said on the mind-brain problem.

—*M.B.R.*

The Working Brain: An Introduction to Neuropsychology, by A. R. Luria. New York: Basic Books, 1973.

The most distinguished Soviet psychologist of our century brings together the results of his study and research of some 40 years into a statement of the principles of neuropsychology. The presentation of today's knowledge of the structure and operation of the parts of the human brain and their collaborative functioning is given its historical background and its "appropriate place in the grand design of psychological science."

Here is a freshly-minted classic for the basic professional library, the seasoned work of a modern-day scientific leader.

—*M.B.R.*

On Writing, Reading and Dyslexia, by Arthur Linksz, M. D. New York: Grune and Stratton. 1973.

An often rambling, linguistically and culturally wide-ranging essay on the visual aspects of language acquisition and on the teaching of writing and reading. On the former, as a respected ophthalmologist, Linksz is entitled to speak with some authority. On the latter, he often does amazingly well for a self-styled amateur, but also often speaks with more assurance than he is entitled to with his obvious and admitted lack of sophistication in the area.

—*M.B.R.*

Learning Difficulties: Causes and Psychological Implications—A Guide for Professionals, by Kurt Glaser, assisted by Suzanne Glaser. Foreword by Leo Kanner. Springfield, Illinois: C C Thomas. 1974.

An 81 page essay "covering the waterfront" of all but the most severely and obviously organic types of learning disorders. The authors include a wide range of ages and degrees of difficulty stemming from physical, psychological, genetic, environmental, and educational causes and their interrelationships. It is, therefore, a necessarily superficial though sound and readable introduction, rather than such a treatment as the title implies.

—*M.B.R.*

More Help for Dyslexic Children, by T.R. Miles and Elaine Miles. London: Methuen Educational Ltd., 11 New Fetter Lane, London EC4P 4EE. 1975.

This gifted couple, diagnosticians and therapists both, have added in their new book many suggestions supplementary to Professor Miles' earliest volume, *On Helping the Dyslexic Child*, reviewed in Bulletin XXII, pp. 176–177. They obviously have the alphabetic-phonetic regularities of the English language well-assimilated in their own minds and can draw on a wealth of knowledge to use in teaching, and to share with colleagues.

The authors give sound, interesting information bearing on a variety of specific, immediate needs, such as for the spelling of groups of similar words, but these are presented on rather a *pot pourri* basis. This still leaves to the teacher, as did Dr. Miles' previous book, the problem of systematic organization. Although this approach is designed to give teachers freedom to proceed in accordance with their own preferences and the children's individual needs, rather than by "cook-book," we wonder whether most users of the books are, in fact, equipped to provide the structure with which to undergird their

teaching. For those to whom it seems that an ordered presentation of language structure and function provides security and reliability needed by dyslexic students, this seems the books' chief inadequacy. To change the metaphor, one can find valuable nuggets here, but not a monetary system.

It was somewhat of a surprise and disappointment, also, to find the authors continuing the old misinterpretation of Orton's view of the language difficulty as " . . . due . . . to some abnormality of brain function . . . " when, in the reference cited, Orton was at considerable pains to show why he considered the persons in question to exhibit *not* defect or deficiency but difference—"a normal neurophysiological variation" in constitutional type. Perhaps this is just an unfortunate use of the word "abnormality," for the Miles' attitude and advice in both description and teaching is clearly based on the "difference" postulate.

—M.B.R.

Learning Disabilities: Concepts and Characteristics, by Gerald Wallace and James A. McLoughlin. Columbus, Ohio: Charles E. Merrill Pub. Co. 1975.

This book will acquaint professionals and others with the historical directions, current influences and practices, and some of the questionable aspects of the educational concept of learning disabilities.

Part One shows the dimensions of learning disabilities, development of the concept, etiology, and diagnostic strategies. Part Two characterizes perception, motor activity, spoken language, reading, written language, arithmetic, and social-emotional problems. Part Three deals with educational services, parents, emerging directions, and prevention. Each chapter has extensive references and summaries of procedures, programs, and materials.

In regard to the child with language difficulty, one wonders why the Jansky Predictive Screening Index and the Satz Early Identification Tests escaped mention, and why one would wish to rule out learning problems as a compounding factor of emotional problems when, indeed, the former might be the primary cause of the latter.

If there is well-trained personnel (and thereby hangs the tale for helping any of these children!) the "IAPE" process of Identifying efficiently and economically, Analyzing academic and psychological learning processes, Planning educational intervention, and Evaluating properly in terms of education goals seems sound.

Since such a wealth of information is given in such an attractive and readable format, readers of this book cannot help but come away better

informed about the field. Since widely varying opinions are given for most of the points presented, the layman will conclude that more research in each aspect is immediately needed so that helpful programs can be developed for learning-disabled youngsters.

The even moderately sophisticated student of *language* learning difficulties should not expect to find new insights here. He may, in fact, wish to raise some questions with the authors. However, he will most likely go from this book with a wider knowledge of the broad, general field of *learning* disabilities, which is the purpose of this text designed for college students and others seeking introductory information.

—*A. K.*

Word Play: What Happens When People Talk, by Peter Farb. New York: Alfred A. Knopf. 1974.

What a pleasure to read a scholarly book about language and linguistics in unpedantic language by a word lover.

The author shows how our language is changing (e.g., "helpmate" came originally from "help" plus "meet," meaning "fitting"). Thinking is language spoken to oneself, and experience is meaningless until language makes sense of it. The statement of the Cambridge philosopher Wittgenstein, "The limits of my language mean the limits of my world," leads to a chapter about man's being at the mercy of his language. We do not wish to duplicate reality, but to recall, and each language comments in its own way.

We have conscious sign languages developed by speech communities with consistent gestures as modes of expression, and the unconscious gestures that accompany speech, such as those of teachers whose body language conveys their expectations of students' performances.

Since today's media lead to faster-than-ever language changes, the author's presentation of language according to theories of play and games—as interacting systems of grammar and of human behavior—is important.

Word Play is an informative treasure in its hardback version and clear layout, and equally witty and fascinating in paperback format.

—*A. K.*

Phonics for Thought, by Lorna C. Reed, Louise S. O'Rourke and Edith D. Wile. Workbooks A and B, and a Teacher's Guide for each. Book C is in preparation. Newfield, N.J.: DPR Publishers. 1974.

If you need a set of phonics workbooks to supply or complement an alphabetic-phonic first-teaching program, take a look at these.

In 1957 Mrs. Reed, with Donald S. Klopp, published a sound and useful little book, *Phonics for Thought*, from which many therapists have drawn interesting and enlivening ideas for use in their teaching. It was a universal favorite in my teacher-education classes and I wish it were still in print. In the current series, Mrs. Reed and her co-authors have endeavored to put their ideas into workbook form for teachers' ready use.

The finished product looks superficially like many another such book, with simple pictures, lines to draw, letters and words to write, but structure is apparent from the start. An alphabet border appears each time a new letter is introduced bearing key pictures for *all* of the 11 letters to be covered - and thoroughly explored - in the first volume. Examination of the teacher's guides and the content and succession of the lessons shows further the influence of Mrs. Reed's early instruction in regular conferences with Anna Gillingham as she worked out, and tried out, her first book. She has carried into the workbooks the principles of multisensory, systematic teaching of the sound-symbol relationships. She sets the stage and provides the lines for the children's cumulative mastery of decoding and encoding techniques, always with the purpose of understanding and thought.

These materials have been use-tested in many public school classrooms in east-central New Jersey, where they have met with enthusiastic response from teachers, parents and, most important, children. The children's progress has been, on the whole, well above average, with very few of them being inadequate learners and with many developing into competent, independent readers and writers with a refreshing enthusiasm for language pursuits, before third grade.

Perhaps "any good phonics program in the hands of a skilled teacher" can achieve these results. Still, when one comes along which is, by design, consistent with pedagogical principles we value, and is planned for easy acceptance and use in classrooms, we should take advantage of it.

–M.B.R.

Language Sampling, Analysis, and Training; A Handbook for Teachers and Clinicians, by Dorothy Tyack and Robert Gottesleben. Palo Alto, California: Consulting Psychologists Press. 1974.

Seldom have we seen such a clear, orderly and practical handbook in any

subject, let alone one as complex and potentially confusing as the treatment of language-delayed children. The authors have thought through the linguistic and psychological theories and their psycholinguistic combination. They have applied them to the analysis of children's basic language samples (two to six word sentences), the setting up of specific intermediate and long-term goals for individual improvement, and the writing of behavioral management programs for achieving the goals. Record-keeping plans are rigorous but simple and practical, with clearly organized and printed forms. This is not a quick and easy, informal program, but it is designed to make every one of many moves count. Empirically tested, the system works as it should toward the most efficient use of the clinician's time and the best possible progress of each child, whether he be treated in a group of three or four or individually.

Although ages are not discussed, we take it that most of the children are young, with beginning readers and writers among the older or more seriously delayed patients. The program stems from work done at the Scottish Rite Institute for Childhood Aphasia in San Francisco.

—*M.B.R.*

SEARCH: A Scanning Instrument for the Identification of Potential Learning Disabilities. Archie A. Silver and Rosa A. Hagin. New York: N.Y.U. Medical Center.

A new and promising pre-school test. For description see final paragraphs of the paper, Fascinating Journey: Paths to Prediction and Prevention of Learning Disability, in this issue of the *Bulletin*.

—*M.B.R.*

Česká Logopedie, 1972, and 1973. Prague, Czechoslovakia: Česká Logopedika Společnost.

This is the journal of the Czech Logopedic (language disorder) Society, and is the opposite number of our *Bulletin of the Orton Society*. As far as we know, these are the first two issues. It is organized as was our *Bulletin* in the days before the initiation of our newsletter, now called *Book and Quill*, with papers, reprints, reports of conferences, book reviews and personal-professional news. Unfortunately, most of us do not read its language, in contrast to several of our readers in Czechoslovakia who make out better with their copies of the *Bulletin*. However, with the help of an English Table of Contents in one issue and a few English and German summaries in the other, and with the international nature of some of our common technical words,

we have learned a lot. We have also experienced the common plight of the dyslexic—frustration in the fact of tantalizing verbal symbols we know to be about something we are vitally interested in but can't get at because of our language limitations, a salutary experience we would rather be without!

The names of people familiar to those of us who have traveled on dyslexia business to Czechoslovakia are there: Matějček, Žlab, Sovák, Holá, Reinerova, and others. They write on the familiar topics of the history, nature and prospects of dyslexia, laterality and language, and methods of teaching and their results, including a follow-up study of children in a special school for dyslexics. We suspect that one of the most significant articles in the first issue is a reprinting of the 1904 paper by A. Heveroch which broke ground in his country (quite independently) as did Hinshelwood's paper in England only eight years earlier. The translator of the title (only) gives us, "About the onesided [specific?—Ed.] disability to learn to read and write in spite of excellent memory." We hope someday to receive and print a translation of this historic paper, which was the starting point of one of the world's most effective country-wide programs in our field.

We were interested to see among the personal items an appreciation of PhDr. Zdeněk Matějček on the occasion of his fiftieth birthday. We join in wishing him, his colleagues and their journal well in their excellent work.

—*M.B.R.*

National Geographic WORLD. Washington, D.C. (20013): National Geographic Society. 1975.

Those of us who have been appreciating the Alexander Graham Bell Association's adaptation from the *National Geographic School Bulletin,* in the similarly illustrated *World Traveler,* look forward to this new publication by the adult magazine itself. Its text will be somewhat more advanced than *World Traveler's* but still designed for the elementary school reader (no condescension, though!). Its eight and one-half by eleven inch size will make possible fine, big pictures, with poster-size double spreads. The photography will draw on the *Geographic's* unparalleled collection. We see children poring over old and new copies of the *Geographic,* despite the, to many of them, unreadable text. Now they will have a Geographic of their own and we predict that they will read it from cover to cover. Our classrooms and tutoring rooms should be ready.

—*M.B.R.*

T. E. T. Teacher Effectiveness Training, by Thomas Gordon. New York: Peter H. Wyden. 1974.

For those who have taken Parent Effectiveness Training courses, this follow-up book with its focus on teachers is a welcome addition. It is an explicit guide for teaching the principles and skills of effective human relations in the school setting. We are led into seeing who owns what problems, what students' coping mechanisms are, and how teachers can dare to get close to their charges without "losing control."

Extensive discussion of the problem-solving process shows how conflicts can be resolved with neither party's being the loser. Dialogues show us examples of roadblocking ("You're just trying to get out of that assignment!") and methods of facilitating communication, such as active listening. There are many suggestions for modifying the classroom to make it less stimulating, enlarging it for more opportunities, or re-arranging it for more systematizing. We learn of teachers' language of unacceptance: "you-messages" which often embarrass or anger, or make the student feel stupid, guilty, or ready to give up, or the indirect messages which are too often misunderstood and seem sneaky. By contrast, "I-messages" have a high probability of promoting change because they are an honest sharing of the teacher's feelings and contain a minimal negative evaluation of the student.

T.E.T. gives excellent direction to teachers for listening and sharing so as to develop new and better relationships with young people.

—*A. K.*

Pedigree: The Origin of Words from Nature, by Stephen Potter and Laurens Sargent. New York: Taplinger Publishing Co. 1973.

Wide-ranging geographically; erudite etymologically; interesting to those who enjoy Eric Partridge's *Origins*, literature, plants and animals. For the teacher's reference shelf.

—*M.B.R.*

Principles of Childhood Language Disabilities, ed. by John V. Irwin and Michael Marge. New York: Appleton-Century-Crofts. 1972.

Because language disabilities are the concern of many disciplines, an interdisciplinary approach to their understanding and solution is needed. This text ably serves as a synthesis of data from the fields of medicine and education. A variety of contributors progress from a description of the linguistic approaches to viewing disabilities etiologically, showing how they

affect emotionally disturbed, hearing impaired, disadvantaged, and cognitively involved children. Both medical and non-medical evaluations are discussed, as well as educational management of reading, writing, spelling, and listening deficits. The high qualifications of each of the authors in his field makes this book authoritative and valuable as a guide for future research and as a resource book and guide for doctors and educators. —*A.K.*

Helping Children Overcome Learning Difficulties, Jerome Rosner. New York: Walker and Co. 1975.

In this book the author speaks in plain language to parents about how they can help their children analyze, organize and associate information more efficiently, and help to modify their school lessons to take into account their strengths and weaknesses. He believes in treating learning problems directly, considering other problems to be of secondary importance.

The three parts of the book concern themselves with testing, teaching and prevention. Simply written, with a positive feeling, the author does not oversimplify or feel the job is easy. Children with learning problems can be helped by the right kind of intervention, and enough specifics are included to give concerned parents the guidelines they seek if they are to help their children live up to their potentials. —*A.K.*

Can Your Child Read? Is He Hyperactive? William G. Crook, M. D. Jackson, Tennessee: Pedicenter Press. $3.95 (paperback).

We are always regretful when a book that promises well turns out to be a disappointment. Interestingly enough, this book caricatures the chaotic state of the learning disability-hyperactive child syndrome. The author intends to clarify the problem by providing specific guidelines for befuddled parents, but actually accomplishes the opposite by presenting a confused, disorganized collection of truths and myths which combine to camouflage reality.

The book is replete with contradictory statements and inconsistencies. The writer's own ambivalences and, seemingly, lack of sophistication in this field shows through in chapter after chapter. In addition, the book contains many minor inaccuracies, including an outdated address for the Orton Society, and the wrong date of publication of Samuel Orton's classical book. He also fails to mention Critchley's new edition in the reference list, and misspells Ellingson's name.

Dr. Crook is especially interested in dietary factors, particularly in allergic reactions to foods and he repeatedly emphasizes these factors as being

important in contributing to hyperactivity in learning disabilities. Yet, he contradicts his own premise when he states (p.174) "Now I'll concede that T.V. advertising is misleading, and that the dietary habits of many young people leave a lot to be desired, but why do 20 percent have trouble in school and 80 percent not have trouble, when almost all of them eat a relatively similar diet?" No doubt allergic factors should be paid attention to, but they do not seem to be a significant factor in specific language disability.[1] Unfortunately, although he issues appropriate warnings about its improper use and overuse, Dr. Crook endorses the use of Ritalin. He even embraces mega-vitamin therapy for some children. In fact, one problem with his book is that whereas he makes some excellent statements and provides important citations he also presents as established facts views which are generally considered to be invalid or not scientific.

His section on testing as used in his own program is puzzling because of the inadequacy of the battery offered and the apparent lack of understanding as to what is being measured by the various tests. This may have been an omission due to lack of space for more detailed explanation. Whatever the reason, his suggestions for appropriate testing of children with suspected learning disabilities is inadequate and misleading.

Perhaps the two best quotations he presented in his book are the following: Dr. Ralph Rabinovitch's (1973) "Although drugs may be important in the helping of these children, I seldom prescribe them. I believe that these drugs have been over used," and Dr. Archie Silver's (1973) "The need for medicine lessens dramatically when hyperactive children are given proper teaching . . . teaching that will let them succeed."

Dr. Crook makes a strong and repeated pitch for teaching phonics and recommends a do-it-yourself kit for use by untrained people, including parents. At the same time, he repeatedly states that every child is different and that some may not benefit. He repeats the old disproven myth of the auditory dyslexic who cannot be taught by a phonics approach. Although he emphasizes the importance of one-to-one tutoring, he does not seem to understand the importance of methodology.

Although the author is obviously well-motivated and has genuine concern

---

[1] Kline, Carl L. and Kline, Carolyn Lacey. *Follow-up Study of 216 Dyslexic Children from a Group of 750 Children Evaluated in the Past Four Years.* Presented to the World Congress on Dyslexia, Mayo Clinic, Rochester, Minnesota, November, 1974, and published in this volume.

for the learning-disabled child, his book does not provide a helpful guide for bewildered parents.

—Carl L. Kline, M.D., C.R.C.P.(C)
805 West Broadway
Vancouver, V5Z 1K1, British Columbia,
Canada

Teaching Children to Read and Write, by Alfred F. Deverell. Toronto and Montreal: Holt, Rinehart and Winston of Canada, Ltd. 1974.

Teaching Children to Read and Write is a book that Orton-Gillingham-oriented people should read, discuss, and PUSH (into their teacher-training universities and school board offices). The author, Professor Alfred F. Deverell, Professor Emeritus of Education at the University of Saskatchewan, has written this well-documented book primarily for student teachers. However, its wide range of subjects makes it a valuable resource book for anyone interested in teaching reading and concerned about the escalating number of language-disabled students in schools today.

The message of *Teaching Children to Read and Write* is: Begin reading instruction with an intensive, structured, alphabetic-phonic method and delay liberating the child into an individualized, independent program until he has learned "the code." Dr. Deverell's arguments are convincing and his reference to research (including his own) are highly persuasive. He is especially critical of the "reading readiness" theory, and maintains that "the longer a child's experience with employing memory to store and use the arbitrary materials of counting, reciting the alphabet, reciting rhymes, and the like is delayed, the more difficult it becomes for the child to perform these tasks. Earlier rather than later training is a cardinal principle." This concept, of course, is supported by the cognitive psychologists.

This is a book about the classroom teaching of reading, not about remediation of severe language disabilities. As crusaders who long have despaired over the poor or non-existent training that student teachers receive in the teaching of reading, we cannot but welcome this strongly worded, intellectually stimulating book that at times reads like a first cousin of the Gillingham-Stillman Manual.

The contents range from a theoretical consideration of the analysis of the reading process, through a brief but cogent review of the history of the teaching of reading, to specifics in how to start the beginners and how to proceed on to "the sophisticated side of oracy and literacy." Dr. Deverell is a

firm believer in the need to reinforce all structured, basic, code-emphasis reading instruction with equal attention to written work, and he is most explicit in how this should be done. He criticizes the failure of teacher-educators to utilize the pro-phonics research and information "readily available to them since 1938," saying that in their blind insistence on poorly organized, meaning-emphasis programs they actually have *produced* the large number of dyslexic and dysgraphic children in our schools today.

Included in this book is an extremely valuable introduction to linguistics with practical references to the implications of this relatively new science for the teaching of reading. But Dr. Deverell does not dwell on the abstract and the theoretical at the sacrifice of the practical and pragmatic. The underlying theme of the book is gutsy indeed: a step-by-step guide for instructing children in reading, spelling and handwriting. There is a meticulous analysis of three popular reading programs, *Language Patterns, The Linguistic Readers,* and *The Ginn Integrated Language* Program. (These are respectively a highly synthetic approach, a linguistic approach, and a whole-word with gradual phonics approach.) Although a hypothetical lesson plan is described for each program, the groundwork favoring the alphabetic-phonics-multisensory program is so well laid at this point that any student teacher studying the text surely would not hesitate in the choice of method.

Dr. Deverell describes reading as a two-stage process: "The first stage is that of acquiring the capacity to relate visual symbols—letters and words—to spoken sounds. . . .It can be accomplished by children whose intelligence quotient as measured by tests is considerably below 80 and by children whose socio-economic background is limited. . . .The word and sentence *identification* process must precede the *comprehension* process, which is stage two. . . ..(stage two) is strongly influenced by intelligence, by socio-economic background, by familiarity with language, by familiarity with the material being read, by motivation, physical conditions of reading, and other factors."

Appendices are included using large-print pages suitable for preparing overhead transparencies for classroom instruction. Anticipating the need for the primary teacher to evaluate the reading and writing level of the student, Dr. Deverell also has provided 35 pages of individual and group tests with explicit instructions for administration and scoring.

One important area of critical concern that has been avoided by most reading experts is television. With characteristic vigor and decisiveness Dr. Deverell plunges into this sensitive area to wage war. "Television obliterates time and space; its images are directionless. It does everything, while the

viewer passively sits, looks, and half-heartedly listens. Today's electronic media-raised child is ill-prepared for systematizing his mind into directionally-oriented lines of print which represent the time sequences of the human voice." Later in the book Dr. Deverell attacks television for "cultivating a flippancy of outlook; an unwillingness to engage in the apparent drudgery of reading and writing, or of understanding and committing to memory vast quantities of information not immediately pertinent to existence. Under these circumstances the temptation is for the school to offer reading material which is light, amusing, and inconsequential . . . thereby confirming the child's view that the whole process is quite unnecessary."

Teaching Children to Read and Write is an important contribution to the teaching of reading. If its message were heeded and put into practice in the primary grades, the next generation of school children might be spared the emotional bruising and the academic traumatization of today's language-disabled children.

—*Carolyn Lacey Kline*
805 West Broadway
Vancouver V5Z 1K1, British Columbia
Canada

New Book to Include State-of-the-Art Papers from World Congress on Dyslexia

Ten other papers from the World Congress on Dyslexia (in addition to those appearing in this issue of the *Bulletin*) are being published in book form (Autumn 1975). Entitled *Reading, Perception, and Language*, and edited by Drake D. Duane and Margaret Byrd Rawson, a paperback edition is being published by the Orton Society and a cloth edition by York Press. The book brings together material by eminent authorities from several disciplines. Topics include the history, nature, and prospects of developmental dyslexia; language structure; neuro-anatomy and language; memory and cognitive skills in reading; visual and auditory perception; cross modality learning; emotional aspects of language disability; and educational treatment of developmental dyslexia. Either edition may be ordered, prepaid, from the Orton Society (paperback $6.00, cloth $12.50 until January 1, 1976). Orton Society members may deduct 20% when ordering through the Society's office (either edition).

INSTRUCTIONS TO CONTRIBUTORS

The editor of the annual ***Bulletin of the Orton Society*** welcomes the opportunity to consider for publication in the ***Bulletin*** any article dealing with dyslexia. Manuscripts submitted should be *typed double-spaced throughout, with no single-spaced material whatsoever.* The original (preferably on non-erasable bond paper) and one copy should be sent to The Editor, Bulletin of the Orton Society, 8415 Bellona Lane, Towson, Md. 21204. The author should always retain at least one copy of every manuscript. The author's name, academic degrees, professional affiliation (if any), and return address should be typed on the title page or in a covering letter. Always include a self-addressed envelope with proper postage clipped, not glued, to the return envelope.

The ***Bulletin*** is published in the Fall each year. The deadline for submitted manuscripts is January 1 preceding publication. Notice of acceptance or rejection will be sent as soon as possible—usually within one month after the manuscript arrives in our office.

Please become familiar with the types of paper that appear in the ***Bulletin*** and follow the general format of the type of paper you wish to submit. Papers are commonly edited in our office to improve the effectiveness of communication. When editing is extensive and might have altered the author's meaning, papers are returned to the author for approval before type is set. The earlier the manuscript is submitted, the more opportunity there will be for such editorial interchange.

Errors can be avoided if bibliographies are submitted in the form used by the Bulletin, that is: author's last name, initials or first name, followed by date of publication, followed by the title of the book or article; the volume of a periodical; pages of the article, or (in the case of a book) the city of publication and name of the publisher. For additional details, please examine bibliographies published in the ***Bulletin*** before typing your bibliography.

Begin the title of your paper with a word useful in indexing and information retrieval. Keep the title short—if possible, not more than six words.

Line drawings to accompany your article should be submitted ready for publication, drawn clean on white paper with black India ink. Photographs should be high-contrast, glossy, black-and-white prints. Submit legends for illustrations on a separate page, not attached to the illustrations. Legends should by typed double-spaced and each one should be clearly keyed to the proper illustration.

Each table should be typed on a separate sheet and numbered. Continue to double-space. Each column must have a heading. Do not use vertical rules on tables. Keep tables simple and as small as possible.

Unless your article is very short (two or three typed pages) please insert short subheads in the text to mark your main ideas. If possible, keep the length of your manuscript under 20 pages.

The editor will be pleased to answer inquiries about articles prior to submission.